A GEOGRAPHY OF EUROPE

BY

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MACMILLAN AND CO., LIMITED
ST. MARTIN'S STREET, LONDON

1912

PREFACE.

THE lessons into which this book is divided consist of (*a*) practical exercises, based chiefly on map-reading and statistical tables; (*b*) a short description of the region; (*c*) questions which require descriptive answers. The lessons vary somewhat in length; in a long lesson the teacher can choose the exercises most suitable for his purpose, while in the shorter lessons some of the Examination Questions at the end of the book can be utilised with advantage. It should be noted that many of the questions can be taken orally in class; questions requiring long written answers have been carefully avoided. An elementary knowledge of Physical Geography is assumed, and some exercises are set on this branch of the subject.

In dealing with Europe regionally, it has been impossible to ignore the political divisions; in some cases, such as Spain and Portugal, the geographical and political divisions coincide, while in others, such as the Central Plain of Europe, the descriptions of the various parts belong to different political states.

The lessons on the British Isles are not detailed. It is presumed that a systematic course of lessons has been taken from another volume of this series, viz. *The British Isles*, by Dr. A. Morley Davies, or a similar work.

Great care has been taken in the preparation of the maps, especially with regard to clearness and accuracy. Throughout the book the maps are intended to illustrate some particular point in the lesson; a good school atlas, containing orographical and other maps, should also be used.

The statistical tables have been prepared from the Annual Statements issued by the Board of Trade, the various Consular

Reports, the *Statesman's Year Book*, and other works of reference. In all cases, except where otherwise stated, average results are given, and these are based on the most recent figures.

In writing the descriptions, the works of Chisholm, Mill, Partsch, and many other authorities have been consulted.

A table showing the chief branches of the European races is given on p. 247; this table is intended for reference only, and not necessarily for use as a separate lesson.

After using geographical text-books for many years, the author feels that he may unconsciously have adopted as his own, not only ideas, but also modes of expression, from other writers. He trusts that this has not occurred, but if there are such cases he wishes to acknowledge his indebtedness, and regrets that he is unable to recall all the sources of his information. Due acknowledgments must also be made to the editors of the series (Prof. R. A. Gregory and Mr. A. T. Simmons) for many valuable suggestions.

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ST. DUNSTAN'S COLLEGE,
CATFORD, S.E., *March*, 1912.

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LESSON I.

PHYSICAL FEATURES AND POPULATION.

THE figures in the following table are based on the Census returns of 1911. In calculating the number of people per square mile, the population of the county boroughs has been added to that of the counties (except in the case of London).

DENSITY OF POPULATION IN ENGLAND, 1911.

County.	Popn. per sq. mile.	County.	Popn. per sq. mile.
Bedford, - - - -	422	Middlesex, - - -	4,836
Berkshire, - - -	384	Monmouth, - -	685
Buckingham, - -	301	Norfolk, - - -	236
Cambridge, - -	241	Northampton, - -	354
Cheshire, - - -	867	Northumberland, -	346
Cornwall, - - -	240	Nottingham, - -	734
Cumberland, - -	169	Oxford, - - -	264
Derby, - - -	664	Rutland, - - -	136
Devon, - - -	273	Shropshire, - - -	186
Dorset, - - -	224	Somerset, - - -	278
Durham, - - -	1,353	Stafford, - - -	1,093
Essex, - - -	816	Suffolk, - - -	267
Gloucester, - - -	585	Surrey, - - -	1,115
Hampshire, - -	587	Sussex, - - -	460
Hereford, - - -	137	Warwick, - - -	1,261
Hertford, - - -	509	Westmoreland, - -	80
Huntingdon, - -	155	Wiltshire, - - -	212
Kent, - - - -	644	Worcester, - - -	644
Lancashire, - -	2,493	Yorkshire, East Riding,	393
Leicester, - - -	594	,, North Riding,	209
Lincoln - - -	212	,, West Riding,	1,103
London, - - -	38,657		

DENSITY OF POPULATION IN WALES, 1911.

County.	Popn. per sq. mile.	County.	Popn. per sq. mile.
Anglesey, - - -	169	Flint, - - - -	321
Brecknock, - - -	82	Glamorgan, - -	1,311
Cardigan, - - -	86	Merioneth, - -	76
Carmarthen, - -	169	Montgomery, - -	69
Carnarvon, - - -	219	Pembroke - - -	147
Denbigh, - - -	240	Radnor, - - -	52

1. From the above table prepare a density of population map for England and Wales. In order to do this, first arrange the counties in four groups, viz. average population 0-200; 200-400; 400-700; more than 700, per square mile.

2. On a map of England and Wales (on which the county boundaries are marked) shade very darkly the counties with the densest population; graduate the shading of the other three groups so that the least populated area is very lightly shaded.

3. On another map of England and Wales shade the coal-fields, and mark the industries carried on upon them; also mark the agricultural areas.

4. Place the density of population map and the industrial map side by side. Note carefully the correlation of the industrial areas and the districts of dense population. Which densely populated area is situated at a distance from the coalfields? Find an explanation for this.

5. On the density of population map mark the following county boroughs.

COUNTY BOROUGHS WITH POPULATION MORE THAN 200,000.

County Boroughs.	Population 1911.	County Boroughs.	Population 1911.
Liverpool, - -	746,566	Hull, - - - -	278,024
Manchester, - -	714,427	Newcastle-on-Tyne,	266,671
Birmingham, - -	525,960	Nottingham, - -	259,942
Sheffield, - -	454,653	Stoke-on-Trent, -	234,553
Leeds, - - -	445,568	Salford, - - -	231,380
Bristol, - - -	357,059	Portsmouth, - -	231,165
West Ham, - -	289,102	Leicester, - -	227,242
Bradford, - -	288,505		

6.

DIFFERENT KINDS OF LAND IN THE BRITISH ISLES.

	Total Area. 1000 acres.	Woods and Plantations. 1000 acres.	Mountain and Heath. Grazing Land. 1000 acres.	Permanent Pasture. 1000 acres.	Arable Land. 1000 acres.
England, -	32,561	1,715	2,416	13,912	10,629
Wales, -	4,778	184	1,324	2,053	729
Scotland, -	19,461	868	9,103	1,487	3,373
Ireland, -	20,713	301	No return available.	9,949	4,631

Make a percentage table of the different kinds of land in England. Make similar tables for Wales, Scotland, Ireland respectively.

7. The following table gives particulars of the most important crops grown in the British Isles.

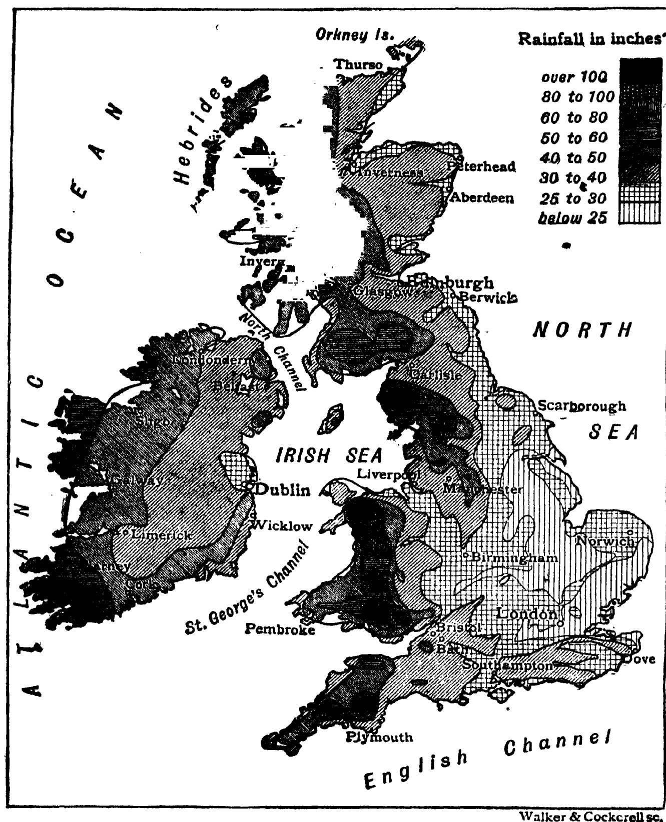
CHIEF CROPS GROWN IN THE BRITISH ISLES.

	GREAT BRITAIN.		IRELAND.	
	Area cultivated. 1000 acres.	Total Produce. 1000 bushels.	Area cultivated. 1000 acres.	Total Produce. 1000 bushels.
Wheat, -	1,705	56,394	40	1,490
Barley, -	1,681	58,676	163	6,859
Oats, -	3,068	127,015	1,057	52,464
Potatoes, -	562	140,920	586	115,320

Find the yield per acre of the crops given above for Great Britain and Ireland respectively.

The British Isles rise from the continental shelf of Western Europe, and they are separated from the mainland by the comparatively shallow waters of the North Sea, Straits of Dover, and English Channel. They consist of a group of islands officially known as the **United Kingdom of Great Britain and Ireland.** Great Britain is the largest island of the group, Scotland being the northern part of it and England and Wales the southern part.

Climate.—The position of the British Isles in the North Temperate Zone (between latitude 50° N. and 60° N.) is one of



Walker & Cockerell sc.

FIG. 1.—BRITISH ISLES. ANNUAL DISTRIBUTION OF RAIN.

the factors which decide the climate. Southern Siberia and Labrador also lie between 50° N. and 60° N., but the extreme climates of these countries present a great contrast to the equable

climate of the British Isles. The warm North Atlantic drift current keeps the harbours of these islands from freezing in the winter, while the south-westerly winds which prevail throughout the year bring warmth and moisture. On maps showing temperatures it will be seen that in the winter months the isotherms have a general direction from north to south, and in summer from east to west.

Rainfall.—The mountains of Great Britain are chiefly in the west, and therefore the rain-bearing winds from the Atlantic deposit a heavy rainfall on the west coast (60-80 inches); as the mountains are not very high, the winds pass over them, bringing rain to other parts of Great Britain, though the amount is less. On the east coast, between the Humber and the Wash, the annual rainfall is only 20 inches.

The mountains of Ireland are near the coast line, while the interior forms a great plain. This arrangement of highland and lowland causes a more even distribution of rain over the whole island. The heaviest rainfall is on the west, but the difference between the rainfall on the west and east coasts is not so marked as in the case of Great Britain.

Weather.—The British Isles lie on the edge of the low pressure area of the North Atlantic, hence they are subject to the cyclonic disturbances which originate in that area. These storms are most frequent in the winter months, when the solar control is least.

The Highlands of Scotland are composed of hard rocks, the highest ridges are bare, and the lower slopes covered with heather and grass. **Cattle farming** is the chief occupation on the moorlands of Southern Scotland; on the Pennines, Cotswolds, and the chalk ranges (Chilterns, Downs, etc.) **sheep** are pastured. In Ireland abundant grass, due to the heavy rainfall, makes dairy-farming the most profitable occupation; cattle and horses are reared in great numbers.

Agriculture is extensively carried on on the Central Plain of England, the clay soils of the Eastern counties and the Lowlands of Scotland. In all these districts wheat, barley, oats, and root crops are largely grown. Hops and fruit are

produced in Kent, Surrey, and Hereford. In Ireland, potatoes are cultivated with greater success than cereals.

Distribution of Population.—As late as the eighteenth century the distribution of population in Great Britain depended almost entirely on the occupations mentioned in the last paragraph. The majority of the people were engaged in agriculture, in sheep-farming, or in some work connected with these industries. The areas of greatest population were then the south-east part of England and the Lowlands of Scotland. Manufactures were unimportant; weaving, glove-making, and other manufactures were carried on by peasants in their cottages, but these men and women frequently did agricultural work for part of the year.

The use of coal instead of timber for smelting iron led to the development of the coalfields; this change was followed by the invention of machines for spinning and weaving, and by application of steam-power to machinery.

These changes brought about a **shifting of the population** from the south-east of England to the coalfields; consequently at the present time the most densely populated areas are (with the exception of the London district) in the north and west of England, such as South Lancashire, West Riding of Yorkshire, Newcastle-on-Tyne, Black Country and South Wales.

All these industrial areas are within fifty miles of the coast, and hence goods manufactured on the coalfields can be sent to seaports at a moderate cost for carriage.

During the past hundred years Great Britain has ceased to be a purely agricultural country, and manufactures have become more and more important. This development has led to a further movement of the population from the rural districts to the manufacturing centres.

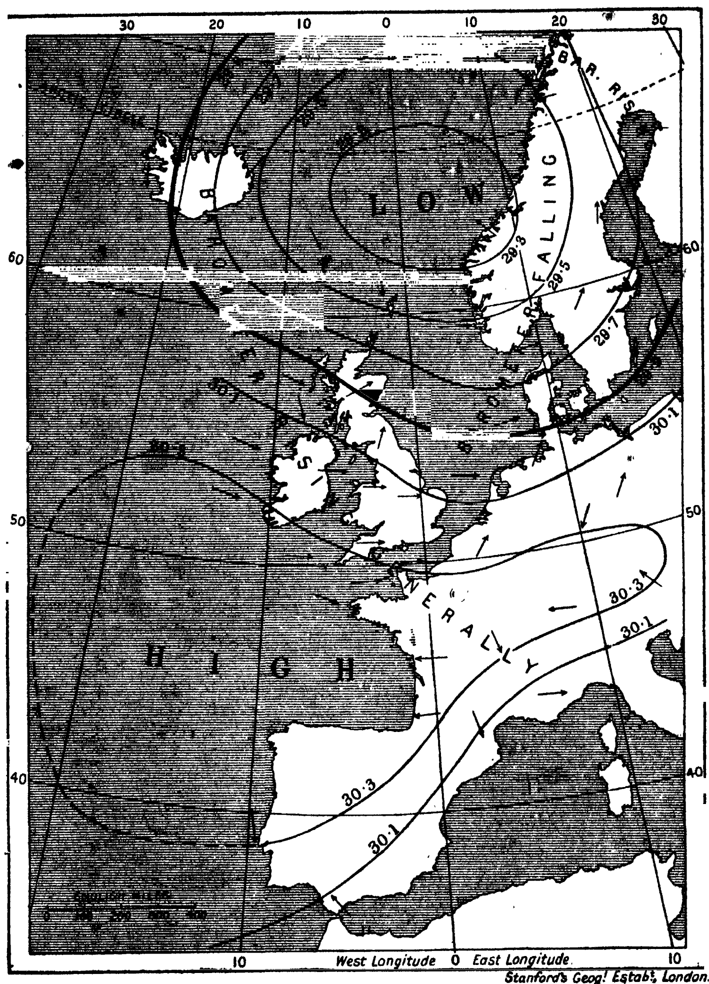


FIG. 2.—WEATHER REPORT, DECEMBER 29TH, 1910. (See Ex. 3, p. 8.)

EXERCISES.

1. Describe the position of each of the following places, and account as fully as you can for its rainfall :

DISTRIBUTION OF RAIN IN THE BRITISH ISLES.

	Annual Rainfall in inches.		Annual Rainfall in inches.
Galway, - - -	52	Dublin, - - -	30
Skye, - - -	103	Aberdeen, - -	30
Penzance, - -	42	London, - - -	25
Bolton (Lanc.), -	59	Leeds, - - -	26
Neath (Glamorgan), -	85	Shoeburyness, - -	19
Seathwaite (Cumb.),	131	Matlock Bath, - -	35

2. Compare Great Britain and Ireland with regard to the cultivation of crops shown in the table (p. 3).

3. In this exercise and in some others (*e.g.* Lesson XIV. 8, Lesson IV. 6) an elementary knowledge of Physical Geography is assumed ; if no work in Physical Geography has been done these exercises should be omitted.

Examine the Weather Report for December 29th, 1910 (Fig. 2).
What lines are drawn on this chart ?
To what do the numbers on the lines refer ?
How can the direction of the wind be determined from the lines ?
Explain the terms *High* and *Low*.
What information can be obtained from the chart as to the weather conditions in London on that day ?

4. A list of county boroughs is given on p. 2, the population of each being over 200,000. Describe the position of each borough and in each case account, as fully as possible, for the presence of a large town at that particular place.

LESSON II.

IMPORTS AND EXPORTS.

1. The total value of British exports per year is about £404 million.

The textiles exported are valued at £159 million; steel and iron goods, £88 million; and coal, £37 million. From these figures make a percentage table of the exports; represent your results diagrammatically on a square (10 inch side).

2. The United Kingdom produces every year about 30 million cwts. of wheat, and imports about 98 million cwts. The imported wheat comes from the following countries:

Sources of Imported Wheat.

Country.	Month of Harvest.	Wheat. 1000 cwts.	Wheatmeal and Flour. 1000 cwts.
United States of America:		17,419	7,337
Southern States,	June		
Northern States,	July		
Argentine Republic,	Jany.	22,287	100
British India,	Feby. and Mar.	11,833	6
Australia,	Jany.	9,445	386
Canada,	Sept.	16,287	2,124
Chile,	Jany.	1,505	—
Russia (in Europe),	July	17,311	6

Draw a circle (radius 4 inches) to represent the amount of wheat imported into the United Kingdom. Divide the circle into sectors, as in Fig. 10, to show the proportion of wheat imported from the countries in the table above. The remaining sector to be marked *other countries*.

3. Weight (in millions of lbs.) of raw materials used in the textile factories: cotton, 1,750; wool, 710; flax, 217. Value (in millions of pounds sterling) of exported goods: cotton, 98; woollen, 29; linen, 8. Taking a vertical column (10 inches) to represent the weight of raw cotton, draw columns for wool and flax. Represent the given values in a similar way.

4.

PRODUCTION AND EXPORTATION OF COAL, 1907-9.

United Kingdom.	Coal raised. 1000 tons.	Coal exported. 1000 tons.
1907	267,831	66,063
1908	261,529	65,181
1909	263,774	65,694

Find the average annual quantity of coal (*a*) raised; (*b*) exported for the period 1907-9.

5.

COAL INDUSTRY, 1909.

District.	Coal raised. 1000 tons.	Export from Principal Ports, 1909.	
		Port.	1000 tons.
Durham, - - -	41,241	Cardiff, - - -	17,732
Yorkshire, - -	35,900	Tyne Ports, - -	12,663
Lancashire, - -	23,706	Newport, - -	3,967
Staffordshire, - -	13,519	Swansea, - -	3,550
Derbyshire, - -	16,876	Blyth, - - -	3,790
Northumberland, -	14,013	Sunderland, - -	3,512
Monmouth, - -	13,204	Hull, - - -	3,279
Nottingham, - -	11,017	Methil, - - -	2,305
Other districts in England,	13,910	Burntisland, - -	1,736
		Glasgow, - -	1,961
Wales, - - -	40,440	Grangemouth, - -	1,819
Scotland, - -	39,768	Grimsby, - -	1,460
Ireland, - - -	89		

On an outline map of the British Isles shade the coal areas given above; where the production exceeds 20 million tons the shading should be darker than for the others. Also mark the ports from which coal is exported; write by the side of each name the percentage of the coal export for that particular port.

6. On a similar map mark the chief towns on each coalfield and the most important industries.

Trade. The outstanding features of the trade of the United Kingdom are:

(*a*) The importation of food supplies and of raw materials for the various manufactures.

(*b*) The exportation of coal and of manufactured articles.

Food Supply. (i) **Bread.** The United Kingdom produces on an average thirty million cwts. of wheat every year, but ninety-eight million cwts. more are required to satisfy the needs of the population. Wheat is therefore imported from foreign countries and from British colonies, especially the United States of America, Russia, Argentine, Canada and India. From the table on p. 9 it will be seen that the harvest time in the wheat-producing countries takes place in different months of the year, hence the wheat reaches the United Kingdom at intervals throughout the year. The wide distribution of the wheat-producing countries also renders the supply more trustworthy; thus, even if the harvest fails in one country it is improbable that it will fail in all parts of the world in the same year. As imported wheat must cross the sea, Britain's very existence depends on keeping the command of the ocean routes.

(ii) **Meat,** etc. Our markets are largely supplied with meat produced in this country. Scotch beef, South Down mutton and Welsh mutton, are noted for superior quality. Immense quantities of chilled beef, frozen mutton and preserved meat, are imported from other countries. The United States, New Zealand and the Argentine are the chief sources of the supply. Frozen mutton from New Zealand (Canterbury lamb) comes chiefly to London for distribution.

Butter, cheese, eggs and poultry are obtained from many European countries, as well as from America, Australia, etc. Milk (except in a condensed or preserved form) is the one article of food that must be consumed near the area of production; it cannot travel far, hence the importation of milk is impossible.

Fish.—Cod, herring and other kinds of fish are caught on the Dogger Bank in the North Sea by English and Scottish

fishermen; Yarmouth, Grimsby, Whitby, Aberdeen and Wick are the most important fishing towns. Mackerel are caught in the English Channel, and pilchards off the coast of Cornwall.

The products of these fisheries are largely consumed in the United Kingdom, but many barrels of herrings are sent to Germany and other European countries.

No other food product is exported from the British Isles; but salmon, lobster and sardines, preserved in tins, are imported.

Manufactures.—Raw materials are imported for all the textile industries; the only fibres produced in this country are flax and wool.

Flax is grown in Ulster, but, as the quantity produced is insufficient, some is imported from the Baltic region to **Belfast** and **Dundee**; linen yarn is obtained from Courtrai, in Belgium.

Raw wool is produced in this country, but immense quantities are also obtained from Australia, New Zealand, Cape Colony, South America, etc., to supply the mills of the West Riding of Yorkshire for the manufacture of cloth, blankets, flannels, hose, carpets, etc. **London** is the greatest wool market in the United Kingdom, while **Leeds** is the centre of the manufacturing area.

Raw cotton, from the Southern States of America, Egypt and India, is brought to Liverpool to be manufactured in the mills of South Lancashire—**Manchester** being the centre of the manufacturing district. The value of the cotton goods exported from the Manchester district is greater than that of any other British export.

Jute, grown in the Lower Ganges Valley, is imported into **Dundee** for the manufacture of sail cloth, bags, etc. Hemp from the Baltic region is used in British seaports for making ropes.

Mineral Productions.—The minerals of Great Britain are a source of great wealth. **Coal** is by far the most important mineral, as on it depend so many industries. No coal is imported into this country, but British coal is sent to nearly every

European state. *About one-fifth of the coal produced is exported, while the remaining four-fifths are used in the various manufactures and for domestic purposes.* Almost every kind of coal is mined in Great Britain, but the smokeless steam coal of South Wales is in the greatest demand for use on ships. **Cardiff** exports more coal than any other port of Europe.

Iron ore is found on or near the coalfields, hence the smelting of iron ore and the preparation of iron as a raw material can be carried on most cheaply on the coal areas; the presence of limestone is an additional advantage, as it is used as a flux in the smelting furnaces. The chief smelting centres are **Middlesbrough**, near the Cleveland iron district, and on the edge of the Durham coalfield; **Swansea**, in South Wales; **Wolverhampton**, and **Dudley** in the Black Country (the South Staffordshire coalfield); **Rotherham**, in Yorkshire, etc. Iron ore is imported from Bilbao in Spain to supplement the home supply.

After passing through many processes, the iron and steel are manufactured into hardware, machinery, rails, etc., at **Birmingham** and the towns in the neighbourhood; cutlery at **Sheffield**, tin-plate in South Wales and ships on the Clyde and Tyne. All these goods are classed as manufactured articles, and they are exported in large quantities.

The production of other metals, such as **copper, tin, zinc**, is small. Copper is obtained from Spain (Rio Tinto mines), tin from the Malay States and zinc from Belgium. These metals are chiefly used with iron in the manufacture of such metal goods as galvanised iron, tin-plate, etc.

Earthenware and **porcelain** are made in the Potteries (North Staffordshire) and at Worcester and Derby. Kaolin, used in the manufacture of fine porcelain, is brought to these centres from Cornwall and Devon.

British textiles and metal goods, noted everywhere for excellence of quality and of workmanship, together form the bulk of British exports; but many other articles are manufactured and exported. These exports are paid for to a large extent by food imports.

EXERCISES.

1. On an average 4,200,000 cwts. of butter (valued at £23,660,000) are imported into the United Kingdom every year. This butter is chiefly obtained from the following countries :

IMPORTATION OF BUTTER.

	Quantity in 1000 cwts.	Value in £1000.
Denmark, - - - - - -	1,763	10,367
Russia (with Finland), - -	612	3,171
France, - - - - - -	390	2,233
Australia, - - - - -	491	2,625
Sweden, - - - - - -	311	1,839
New Zealand, - - - -	288	1,574
Netherlands, - - - -	183	98[illegible]

Which butter fetched the highest price per cwt.? which the lowest? In the case of the European countries, describe the conditions under which butter is produced. How is it that the butter from these countries varies in price?

2. From all sources, the United Kingdom imports on an average every year the following cereals :

IMPORTATION OF CEREALS.

	1000 cwts.		1000 cwts.
Wheat, - -	98,070	Rye, - - - - -	800
Barley, - -	19,325	Maize, - - - -	36,742
Oats, - -	16,533	Flour and Wheatmeal, -	11,327

Some of these cereals come from Europe. The most important countries are given below :

IMPORTATION OF CEREALS FROM EUROPEAN COUNTRIES.

	Wheat. 1000 cwts.	Barley. 1000 cwts.	Oats. 1000 cwts.	Rye. 1000 cwts.	Maize. 1000 cwts.	Flour and Wheatmeal 1000 cwts.
Russia, -	17,311	9,182	6,451	428	3,185	6
Germany, -	184	202	2,944	132	—	520
Roumania, -	915	2,210	429	—	4,623	47
Turkey, -	27	207	65	—	56	—
Austria Hungary, -	—	335	—	—	—	161

Comment on this table.[1] Compare the conditions under which rye and maize are grown in Europe. How is it that the cultivation of barley is distributed so widely?

Of the cereals imported into the United Kingdom, what percentage of each comes from Russia? From which of these cereals can bread be made?

3. The most important articles exported from the United Kingdom to the countries of Southern Europe are given in the following table, together with their average values:

BRITISH EXPORTS TO SOUTHERN EUROPE.

Articles.	Portugal.	Spain.	Italy.	Turkey.	Greece.
	£1000.	£1000.	£1000.	£1000.	£1000.
Coal,	591	1,402	5,555	272	447
Cotton Goods,	437	225	440	1,355	428
Machinery,	200	585	1,454	78	71
Metals (wrought and unwrought),	416	432	1,178	155	89
Ships and Boats (with their Machinery),	84	141	289	177	188
Woollen Goods,	40	95	521	434	175

Examine the above table and comment upon it. Taking these countries together, find the total value of each article in the table; arrange the articles in order of value.

[1] In this and other questions beginning with the word *comment*, answers like the following may be given:

(*a*) Quantity of imported wheat, with flour and wheatmeal (109 million cwts.), greatly exceeds all the other cereals taken together (73 million cwts.).

(*b*) Nearly 19 per cent. of the wheat imported into the United Kingdom comes from Europe.

(*c*) Very little rye is imported—wheaten bread, not rye bread, being eaten in England.

(*d*) Barley is cultivated very widely.

(*e*) Russia exports wheat (*i.e.* a kind of raw material), Austria Hungary prepares the wheat for use (Hungarian flour).

(*f*) Maize comes almost entirely from Roumania and Russia.

LESSON III.

RAILWAYS, CANALS, STEAMSHIP ROUTES.

1. Draw a large map of the Irish Sea. Mark the seaports, and draw lines to show the routes taken by steamers from these ports.

Find the shortest distance (*a*) between the Irish and Welsh coasts; (*b*) between the Irish and Scottish coasts.

2. On a map of the British Isles mark all ports where passengers can land from Atlantic liners. Mark and name the railways by which the passengers can reach London.

3. Draw a diagram to show the levels of the water in the Manchester Ship-Canal from Salford to the Mersey (Eastham), using a horizontal scale of half an inch to a mile; vertical scale half an inch to fifty feet.

Total length—Eastham to Salford—$35\frac{1}{2}$ miles; depth, 26 ft. The canal is divided by locks into five sections:

(*a*) Eastham to Latchford, 21 miles. The level of the water in this section is high water level in the Mersey.

(*b*) Latchford to Irlam, $7\frac{3}{8}$ miles.

(*c*) Irlam to Barton, $2\frac{5}{8}$ miles.

(*d*) Barton to Mode Wheel, 3 miles.

(*e*) Mode Wheel to Salford, $1\frac{1}{2}$ miles. The water at Salford is $60\frac{1}{2}$ feet above sea-level.

It may be assumed that at the locks at Latchford, Irlam, Barton and Mode Wheel respectively, a ship is raised about 15 feet at each lock. At Eastham the locks are not required at high tide.

4. On a large map of Scotland examine the lochs in Glenmore. The waterway through Glenmore, partly natural and partly artificial, is known as the Caledonian Canal.

Draw a diagram to show the levels of the water between Muirtown (near Inverness) and Banavie, using a horizontal scale of half an inch to the mile; vertical scale half an inch to 50 ft.

Length of waterway from Muirtown to Banavie, 60½ miles. Depth of water in the canal, 17 feet. Number of locks, 28.

	Length.	Height above sea level.
Loch Ness, - - - - - -	22½ miles	52½ feet
Loch Oich, - - - - - -	3½ miles	105 feet
Loch Lochy, - - - - -	10 miles	94 feet

All other measurements must be taken from the map.

Internal Transport.—**Railways.**—On comparing a railway map of Great Britain with maps showing contours, industries, and density of population, among other things it will be seen

(*a*) That London is the chief centre from which railways radiate; and that the routes taken by the main lines bear an important relation to the physical features of the country, *e.g.* the east and west coast routes from London to Scotland traverse the low lands on either side of the Pennines; the Great Western line runs along the Thames valley, etc.

(*b*) That the network of railways is thickest on the industrial areas, where of course the population is densest; and few railways run through mountainous districts (usually thinly populated), such as the Highlands of Scotland, the English Lake District, etc.

(*c*) That railways connect industrial areas in spite of physical barriers, *e.g.* the West Riding of Yorkshire and South Lancashire are connected by several lines of railway which cross the Pennines.

Canals.—Barge canals are less important than they were before railways were constructed, but many of them are still used, *e.g.* the Leeds and Liverpool Canal, which crosses the Pennines and helps to provide a water route from the Mersey to the Humber. There are only two ship-canals (*a*) the **Caledonian Canal** through Glenmore, situated at a distance from the great centres of population, and of little commercial value; (*b*) the **Manchester Ship-Canal**, a really important waterway,

as it gives direct access from the sea to the great industrial area of South Lancashire.

Roads are now being used largely for motor traffic.

Maritime Transport.—Coasting Trade.—In addition to the traffic on the railways, canals and roads, goods are also carried by sea from one British port to another. This coasting trade

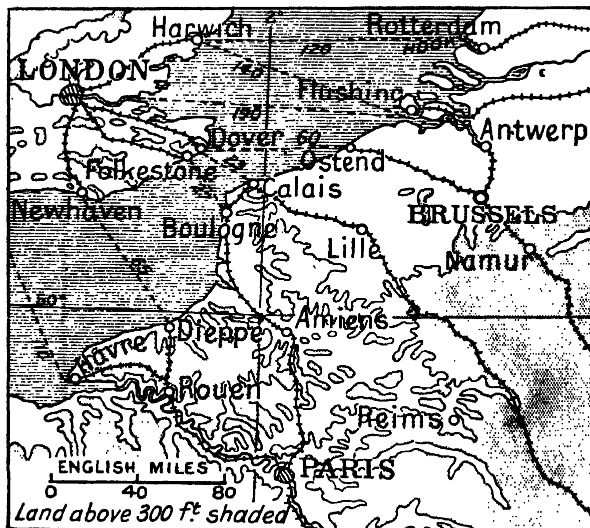


FIG. 3.—ROUTES FROM LONDON TO THE CONTINENT.

is maintained by small steamers and sailing ships. For example, coal from the Tyne is sent to London by sea; kaolin from Devonshire and Cornwall is sent to the Potteries, and there are many other instances.

Continental Trade.—The harbours on the east and south coasts of Great Britain face the Continent of Europe, hence the estuaries of the Thames, Humber, Tyne, Forth and Southampton Water, are all well placed for trade with Europe. In the Middle Ages, London carried on an important trade in wool with

Flanders, and Southampton traded with Bordeaux in wine. During the past hundred years traffic with the Continent has increased so rapidly that now steamers run daily from Dover to Calais and Ostend, from Folkestone to Boulogne and Flushing, from Newhaven to Dieppe, from Southampton to Havre and the Channel Islands, from Harwich to Antwerp and Rotterdam, and from Grimsby to Antwerp. At the present time the term *continental traffic* is somewhat restricted to the movement of passengers and goods along the routes mentioned.

Baltic trade is carried on chiefly through ports on the east coast, viz. London, Hull, Newcastle and Leith; timber, flax, hemp and wood pulp, being the chief articles of trade from the Baltic region. Mediterranean trade in oranges, grapes, currants, figs, olive oil, etc., is connected with London, Southampton and Liverpool.

Trans-Oceanic Trade.—The maritime activity which followed the discovery of America, the establishment of trading positions in different parts of the world and the settlement of British colonies, brought increased prosperity to London, and in a less degree to Southampton and Bristol. It was from Bristol that Cabot sailed on his voyage of discovery to Labrador in the reign of Henry VII.; and in London the East India Company was formed in Queen Elizabeth's reign. At the end of the long struggle (sixteenth, seventeenth and eighteenth centuries) for commercial supremacy, England was left mistress of the sea, and since that time her mercantile service has gradually been developed, until now a very large part of the world's trade is carried in British ships.

The growth of seaports on the west coast, such as Liverpool, Glasgow, Cardiff, belongs to the nineteenth century, and is due almost entirely to the industrial development which took place during that period.

The Bristol Channel, Mersey and Clyde, are the natural outlets for the great productive areas of the west, while raw materials for the industries on these areas can be readily imported. **Cardiff, Swansea, Newport,** all export coal and import iron and copper ore for smelting on the coalfield.

Bristol has for centuries traded with Ireland, and now trades also with the west coast of Africa and the West Indies.

Between the Bristol Channel and the Clyde there is only one opening (the Mersey) with sufficient accommodation for ships, and at the same time near a great manufacturing district. **Liverpool** owes much of its prosperity to the importation of raw cotton. Not only has its American trade rapidly increased, but its trade with West Africa, India, and Australia, has placed it among the leading ports of the world. Liverpool is the headquarters of great shipping companies (Cunard, White Star, and others), and from this port the largest and swiftest Atlantic liners sail to America. Constant dredging is necessary to enable these ships to enter the Mersey.

Glasgow is the seaport for the products of the Scottish coal-fields; some American trade is carried on, but the Clyde estuary is best known for the great shipbuilding industry.

Southampton, on the south coast, has made great advances in recent years in trans-oceanic trade; being nearer London than Liverpool, it has become a rival of the latter port for American passenger traffic. Southampton is also the port from which Union-Castle liners start for South Africa, and Royal Mail Steamers for the West Indies and South America.

In order that passengers may reach London more quickly, some Atlantic liners call at Fishguard, Holyhead, Plymouth, Dover, or some other convenient port.

London, the greatest British port, trades with all parts of the world. Accommodation for the largest ships is provided at Tilbury; from these docks ships of the P. and O. Company start for India and the East, of the American Transport Company for New York, and so on. Between Woolwich and London Bridge ships unload their cargoes either in docks, at wharves on the river banks, or into barges. One feature of the trade of London is the trans-shipment of goods into other vessels for distribution to various ports.

Hull, on the Humber, is well situated for Baltic trade; the Wilson Steamship Company trades with America. **Goole**, at the head of the Humber estuary, is a growing port.

Irish Trade.—Some of the best natural harbours in the British Islands are on the west coast of Ireland (Bantry Bay and others), and yet they are useless for commerce, as they are remote from productive areas. The west coast of Ireland faces the broad Atlantic, but there is no trans-Atlantic trade; except in the north-east Ireland has nothing to export but dairy produce, and imported dairy produce is not wanted in America. Hence all

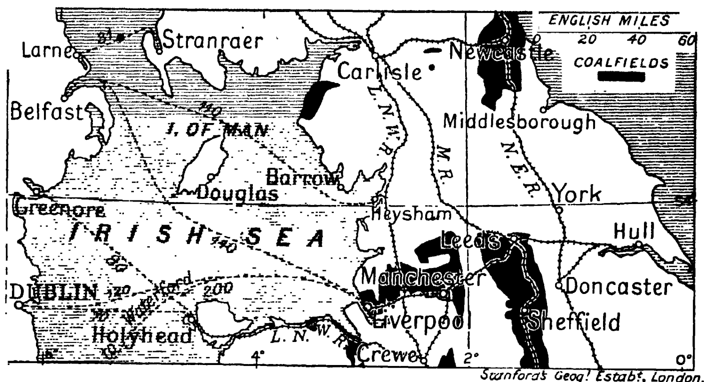


FIG. 4.—THE NORTHERN COUNTIES OF ENGLAND AND THE NORTHERN SEA.

the food-products of Ireland are sent to the ports on the east and south coasts, such as Dublin, Greenore, Wexford, Waterford, Cork, etc., in order to supply the demands of English markets.

Dublin is most conveniently situated for this trade, for it is in direct communication with Liverpool; passengers and mails travel via Holyhead.

Belfast, the only great industrial centre in Ireland, owes its importance to the linen manufacture and the shipbuilding industry. The shipping trade of Belfast is mostly with Great Britain; coal and iron are imported from Scotland.

Belfast is in daily communication with Great Britain via Liverpool, Heysham, Stranraer. Steamers also run daily from Holyhead to Greenore and from Fishguard to Rosslare. Some

Atlantic liners for New York call at Queenstown, and others for Montreal at Moville, on Lough Foyle.

EXERCISES.

1. Compare Liverpool and Southampton in relation to industrial centres and commercial importance.

2. What railways connect the following towns?

(*a*) Edinburgh and Glasgow.
(*b*) Newcastle and Carlisle.
(*c*) Grimsby and Liverpool.
(*d*) London and Bristol.

Point out in each case the route taken by the railway and the kind of traffic carried on.

3. Why were the Caledonian Canal and the Manchester Ship-Canal respectively constructed? In what respects are they both different from the Kaiser Wilhelm Canal? (See p. 49.)

4. Compare (*a*) the diagrams of the Manchester Ship-Canal and the Caledonian Canal (see exercises 3 and 4, p. 16).

(*b*) The commercial importance of these canals.

(*c*) The physical features of the districts through which the canals respectively pass.

5. Distinguish the following kinds of trade: (*a*) Baltic; (*b*) Mediterranean; (*c*) American.

What British seaports are associated with each kind of trade?

PART II.

THE BALTIC REGION.

LESSON IV.

THE BALTIC SEA.

1. On the map of the Baltic Sea draw (*a*) a line from the mouth of the Tornea to the mouth of the Vistula, (*b*) a line from Stockholm to Revel. Measure these lines in miles.

2. Place a sheet of squared paper (transparent) over Fig. 5 and calculate roughly (*a*) the area of the Baltic region, (*b*) the area of salt water within the region.

3. From the map (Fig. 5) find approximately the longitude of Copenhagen, Stettin, Stockholm and St. Petersburg. What time will it be at each of these places when it is noon at Greenwich? Write your answer in tabular form.

4. Find the latitude of Berlin, Danzig, Gëfle, Helsingfors and Gellivara. Draw diagrams (see p. 243) to show the conditions of day and night at Berlin and Gellivara (1) on June 22nd (the summer solstice), (2) on March 21st (the spring equinox).

5. Draw a section along line 60° N. from Christiania to the eastern limit of the map, with a horizontal scale twice that of the map, vertical scale 1 inch for 1000 ft. (Fig. 5).

The Baltic Sea.—On looking at the contour map of the Baltic region it will be seen that

(*a*) its greatest extension is from south to north, viz. from about latitude 50° N to within the Arctic Circle;

(*b*) it embraces a drainage area nearly shut off from the Atlantic;



FIG. 5.—THE BALTIC REGION.

The land, drained by rivers which flow into the Baltic Sea, is enclosed by a dotted line. The shaded areas are over 600 feet in height. In Western Scandinavia, the contour line (600 ft.) has been omitted, as it runs so close to the coast-line.

(*c*) the land area—almost entirely below 600 ft.—is crossed by numerous rivers;

(*d*) there is a large area of shallow sea water, the greatest depth being about 800 ft.

These statements help us to understand the following facts. Because of its northerly position, there is little evaporation except during the summer. The devious channels from the Atlantic, viz. the Skager Rack and Cattegat, as well as the narrow waterways, the Sound and the Belts, put the Baltic beyond the influence of ocean tides, while the sea is not large enough to generate tides of its own (at Copenhagen the tide only rises one foot). In consequence of this, rivers which enter the Baltic have **no estuaries**, and their mouths have a tendency to silt up unless they are dredged constantly.

Navigation in the Baltic is somewhat dangerous, owing to currents set up by winds which blow freely over the low-lying plains around the sea. The general direction of these surface currents is towards the east, and as a result **sand dunes** are formed on the shores of Pomerania and Eastern Prussia.

Because of the numerous rivers which enter the sea, the waters of the Baltic are **brackish**, containing only 7 parts of salt in 1,000 (ocean water contains 35 in 1,000). As fresh water is lighter than salt water, there is a surface current of fresh water which flows out of the Baltic to the North Sea, while the heavier salt water flows in as an undercurrent.

Ice in the Baltic.—It can now be seen why the waters of the Baltic Sea freeze so readily every winter. The chief reasons are its northerly latitude, the shallowness of its waters, its exposure to north and east winds, the absence of tides, and the freshness of its waters. The Sound and other channels are often blocked with drifting ice in winter, but are rarely closed to navigation for any length of time; the central basin of the Baltic suffers little from ice, but the shallow Gulf of Bothnia sometimes freezes from side to side, and it can then be crossed by sledges. The harbours, rivers, lakes and canals of the Baltic region are all frozen for considerable periods every year; ports, like Stettin, which lie at a distance from the open sea, are closed by ice for

two or three months. In 1893 ships were ice-bound for 110 days in the Gulf of Riga. For several months then the sea-going traffic of the Baltic is more or less at a standstill, but mails and passengers are carried from Sweden to Denmark by a service of ice-boats; the railway from Stockholm to the ice-free harbour of Trondhjem provides an outlet, even in winter.

During the summer months the Baltic ports are very busy; goods are carried chiefly in wooden sailing ships belonging to Sweden, Russia and Denmark, while steamers of moderate size trade between Baltic towns and British ports, such as Dundee, Leith, Newcastle, Hull and London. As the Baltic has water communication with the North Sea only, these ships trade mostly in products of the Baltic region, viz, timber, wood pulp, flax, hemp, dairy produce, etc. There is no through communication as in the case of the Mediterranean (via the Suez Canal), hence ships entering and leaving the Baltic are of a different type, both as regards size and equipment, to those which pass through the Mediterranean to India, China, and Australia.

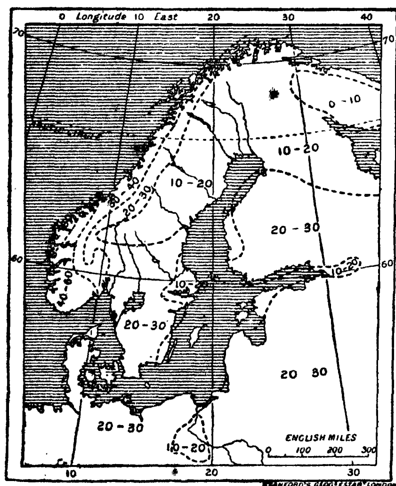


Fig. 6.—Annual Rainfall Map of the Baltic Region.

EXERCISES.

1. Examine the rainfall map of the Baltic region. Account as fully as possible for the distribution of rain shown on the map (Fig. 6). Also explain the rainfall of the following places: Bergen, 90 inches; Stockholm, 16; Christiania, 22; Göteborg, 33.

2. The development of trade in the Baltic is somewhat checked by the physical conditions of the region. Explain this as fully as you can.

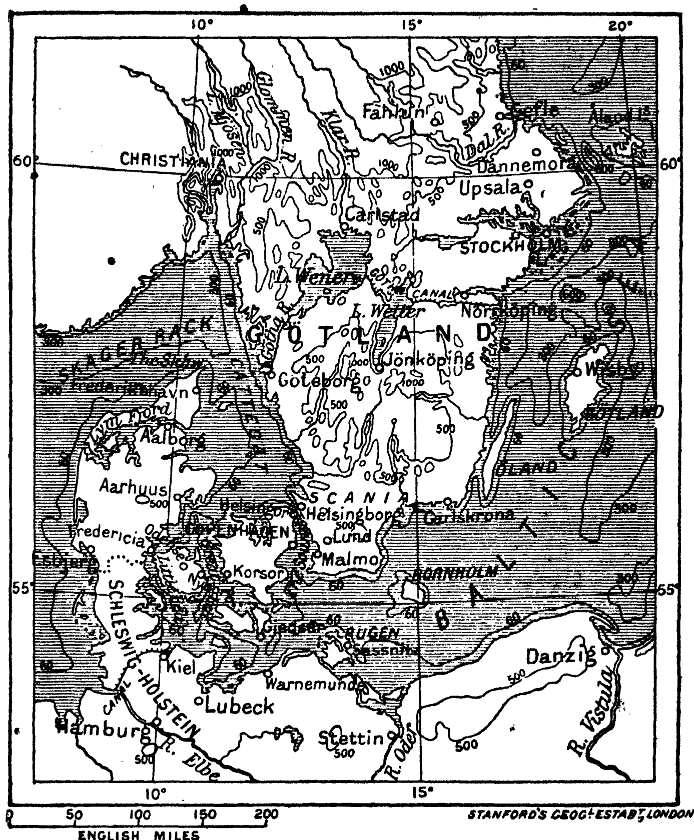


FIG. 7.—DENMARK AND SOUTHERN SWEDEN.

LESSON V.

DENMARK.

1. Draw an enlarged map of Denmark, and mark the following lines of communication:

(1) Copenhagen via Gjedser, and thence to Warnemünde (for Berlin).
(2) Copenhagen to Korsör, and thence to Kiel.
(3) Copenhagen via Korsör, Nyborg, Odense, to Fredericia.
(4) Fredericia (*a*) northwards to Frederikshavn via Aarhuus and Aalborg (railway bridge over the Lym Fiord).
(*b*) Westwards to Esbjerg (thence to Harwich).
(*c*) Southwards through Schleswig-Holstein to Hamburg.

2. Denmark.

AGRICULTURAL PRODUCTIONS OF DENMARK.

Crop.	Area under cultivation in 1000 acres.	Production in 1000 bushels.
Wheat,	100	4,043
Barley,	577	21,409
Oats,	995	41,098
Rye,	682	17,432
Potatoes,	134	25,226
Beet,	565	400,839

In the case of each crop, find the number of bushels to the acre. Why is so much beet grown?

3. The kingdom of Denmark consists of:

	Area in square miles.	Population.
(*a*) Baltic Islands, (Zealand, Funen, Laaland, etc.),	5,148	1,464,200
(*b*) Peninsula of Jutland,	9,904	1,124,700
(*c*) Faroe Islands,	540	16,300

The colonies of Denmark are:

	Area in square miles.	Population.
(*a*) Iceland,	39,756	78,500
(*b*) Greenland,	46,740	12,000
(*c*) West Indies, (St. Croix, St. Thomas, St. John),	138	30,500

Examine this table and comment on it (see p. 15). In

which of the above divisions is the population densest, and in which thinnest? Give the density per sq. mile. Find the total area (including colonies) and the total population ruled by the King of Denmark.

4. The only towns in Denmark with more than 20,000 inhabitants are given below. Draw a sketch map, and mark these towns with the population of each. With the help of Question 3 find how many people live in the small towns and in the country districts.

	Population. 1000.		Population. 1000.
Copenhagen with suburbs, - -	514	Aalborg, - -	32
Aarhuus, - -	55	Horsens, - -	22
Odense, - -	41	Randers, - -	21

Denmark has always owed its independence as a separate kingdom to its geographical position at the entrance of the Baltic. The position is of strategic importance, and in 1852[1] the Powers of Europe considered that the maintenance of the Danish monarchy as a neutral power was necessary to the peace of Europe. The area of the kingdom, however, was much reduced in extent when, in 1864, Schleswig-Holstein became incorporated with Prussia.

Denmark now consists of

(*a*) Jutland, one of the few peninsulas which point northwards;

(*b*) many islands between Jutland and Sweden, the largest of which are Zealand, Funen and Laaland.

(*c*) the Faroes, a group of islands in the North Atlantic, N.W. of the Shetlands.

Jutland has an area about twice that of the islands taken together, and yet more people live on the islands than on the mainland. Next to the Netherlands, Denmark is the lowest

[1] The treaty of London which settled the succession to the throne of Denmark in favour of Prince Christian of Schleswig-Holstein.

lying country in Europe; it is almost entirely surrounded by water, and it has a climate less extreme than that of central Germany.

Sand beaches and sand dunes extend along the west coast of Jutland. Behind the dunes are many shallow lagoons, for example, Stavning Fjord and Nissum Fjord. The Lym Fjord cuts right through from one coast to the other, but is quite useless, however, for shipping, on account of its shallowness. The difference in character between a Danish fjord and a Norwegian fjord (see p. 34) should be noted.

The most northerly point of Jutland is the long dangerous spit of land called the **Skaw**. The east coast is a little higher than the west, and contains a few harbours used by small ships. The interior of Jutland, especially in the north and west, consists of moorland covered with heather, and in some places yields peat for fuel, while the most fertile part of the peninsula is in the south-east.

The best soils of Denmark, however, are found in the islands; **Zealand**, Funen, Laaland, Falster, etc., are all flat and fertile; they are highly cultivated and well populated. Communication is, of course, both across the flat lands and by means of the water channels. The **Sound**, between Zealand and Sweden, is the channel used by most ships entering or leaving the Baltic; it is about 50 miles long, but only 3 miles wide at its narrowest part between Helsingor and Helsinborg. The Great Belt and Little Belt are each about 40 miles long, and they are both dangerous to navigation because of the numerous sandbanks and swift currents. The Little Belt has a very tortuous course, narrowing down to less than a mile at one point.

Occupations.—**The Danes** have always been noted as intelligent, enterprising and persevering, both in war and commerce. Centuries ago they devoted their energies to maritime exploits, thereby gaining possessions such as Iceland, Greenland, and a few West Indian Islands. In recent times they have used their intelligence, enterprise and perseverance in developing the resources of their own country. Denmark possesses no

coalfields, no metals, and, on account of the lowness of the land, no water-power. The Danes, therefore, have been compelled to develop agriculture and the industries which depend on it. With careful cultivation they have made the sandy soils produce crops of cereals, especially oats, barley, rye, although not in sufficient quantities to supply the needs of the population. **Dairy-farming** was found to be the industry most suited to the physical conditions of the country; there were already large tracts of grass-land, but it paid to cut down forests of beech and other trees in order to increase the extent of the grazing areas. Some woods still remain, but timber is imported from Scandinavia. Small farms (5 to 25 acres) are owned by the peasants, and all the milk from the farms is, as a rule, sent to the butter factories, of which there are more than a thousand, and in these the butter is made by machinery. They are managed by an association of farmers, while the sanitary condition of the farms and factories is guaranteed by government inspectors. The quality of the butter thus produced can be relied on, and enormous quantities are exported. Great Britain is the best customer, buying Danish butter to the value of above ten million pounds per annum.

Cheese and eggs are also produced, while horses and sheep are kept on the grass-lands. More than half the people of Denmark depend on agriculture and dairy-farming for their livelihood; the rest are chiefly engaged as fishermen and sailors.

Danish manufactures are unimportant; there are a few flour mills, beet-sugar works and distilleries, while agricultural implements are made at Copenhagen and Odense. Textiles, metals and coal are imported from Great Britain.

Copenhagen (the merchants' haven) is situated on the Sound; its harbour is partly formed by the island of Amager, and it is the only Danish harbour deep enough for large vessels. Copenhagen is strongly fortified; it is also a convenient centre for collecting and distributing Baltic and other products.

Aalborg on the Lym Fjord, and Aarhuus on the east coast of Jutland, are small ports trading in cattle and grain, while

Esbjerg is the only port on the west side of Denmark; steamers cross the North Sea to and from Harwich.

Bornholm, a Danish island in the Baltic, has lofty cliffs of granite and ancient rocks. Building stone and pottery clay are obtained from the island.

The **Faroes** (sheep islands) are formed of volcanic rocks; the inhabitants are engaged in sheep-farming, fishing, capturing sea birds, etc.

EXERCISES.

1. What are the occupations of the inhabitants of the Faroes, Iceland, Greenland, and the Danish West Indies respectively? Describe the positions of these places.

2. How is it that Copenhagen is so much larger than any other town in Denmark?

3. What conditions favour the production of butter in Denmark?

LESSON VI.

WESTERN SCANDINAVIA.

1. On a map of Scandinavia enter the answers to the following questions:

(*a*) the distance of Stockholm from Göteborg (i) by canal; (ii) by sea;

(*b*) the distance, as the crow flies, from Christiania to Bergen, Trondhjem, Stockholm and Copenhagen respectively;

(*c*) draw lines from Christiania to the towns in (*b*) and find their direction from Christiania.

2. Of the total land area of Sweden (172,876 sq. miles) 52·5 per cent. is under forest, 8·9 per cent. under cultivation, 3·3 per cent. under pasturage, and the rest waste land.

Of the total land area of Norway (124,130 sq. miles) 21·5 per cent. is under forest, 3·5 per cent. under cultivation, and the rest waste land.

Find the area in square miles of each kind of land in

Sweden and Norway respectively. On a sketch map mark roughly the different kinds of land.

3. (*a*) On a map of Norway mark the following fisheries, and the chief fishing towns:

NORWEGIAN FISHERIES.

Fishery.	Number of men employed.	Value in 1000 kroner.
Cod, - - - -	87,907	19,150
Herring, - - -	15,882	8,188
Mackerel, - - -	5,467	1,650

(*b*) Find the value of these fisheries in pounds sterling ($18\frac{1}{8}$ kroner = £1). What articles of commerce are obtained from the cod? To what countries are these articles chiefly exported? Write the answers to (*b*) in tabular form under the sketch map.

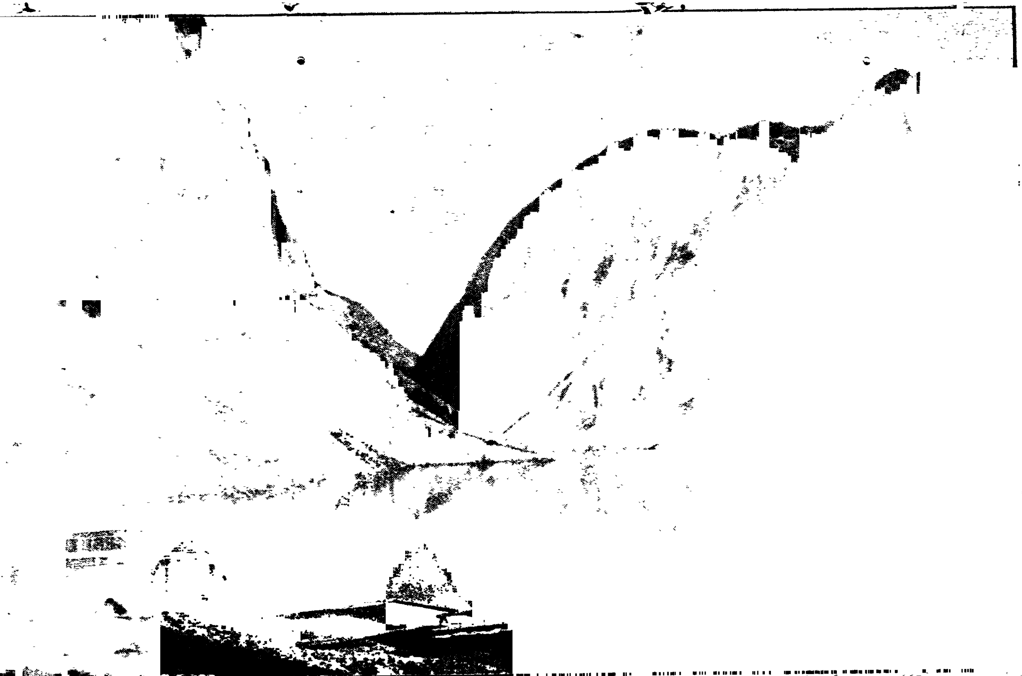
Norway.—When looking at a map of Scandinavia the intricate coast-line of Norway is noticed immediately This coast-line is broken up into innumerable inde[illegible] called **fjords**, and is fringed by hundreds of small [illegible] great expanse of ocean lies to the west; lofty [illegible] from north to south, and there is only [illegible]
land. A visitor to this cou[illegible]
see bold headlands, high cl[illegible]
locked, grand mountain sc[illegible]
latitude and elevation) sno[illegible]

Norway is one of t[illegible]
Europe; it forms the [illegible]
In the south, the nar[illegible]
from the plateau, he[illegible]
Norway consists l[illegible]
in some places, [illegible]
their way. In t[illegible]
are overlaid by [illegible]
the hard rocks [illegible]
and so give a [illegible]

them, however, bear marks of glaciation, as they were scratched and polished by glaciers which once covered the surface of the plateau and filled the valleys. The highest mountain in Norway is the snow-clad **Galdhöpiggen** (8,400 feet), which rises on the eastern side of the great ice-field known as **Jostedalsbrae.** This ice-field has an area of 580 square miles (about the same area as Pembrokeshire); its surface is 5,000 feet above sea-level; and from it flow 24 glaciers, and some of these descend to within 150 feet of the sea. Two other important snow-fields are **Folgefonn** and **Svartisen.**

The more level parts of the plateau consist of dreary moors covered with snow in winter, and in summer with coarse grass and heather, while the lower slopes of the mountains are clothed with dense forests of pine and fir. The drainage from the plateau is chiefly across the eastern slope to the Baltic. The only important river of Norway is the **Glommen,** which flows for 350 miles in a southerly direction into the Skager Rack; its valley affords a direct line of communication between Chris[illegible]nia and Trondhjem. On the western side of the plate[illegible] [illegible]inage water flows down short, steep valleys as mour[illegible] while the precipitous sides of the fjords and valle[illegible] [illegible]h waterfalls—in some cases the leap of t[illegible] [illegible]s 800–900 feet.

[illegible] feature of Norway, however, [illegible]ch give its coast-line such a [illegible] other country in Europe, [illegible] compare with this. The [illegible] **valleys,** that is, valleys [illegible] a subsidence of the [illegible] these valleys were [illegible] islands which now [illegible] from this western [illegible] the islands and [illegible]hed, and in this [illegible]s of the interior. [illegible]leeper than the [illegible] runs into the



The Photochrom Co.

FIG. 8.—NAERÖ FJORD—A SOUTHERN BRANCH OF THE SOGNE FJORD.

Occupations.—Nearly all the towns of Norway are on the coast, and they are all connected with the fishing industry. Salmon is caught in the fjords and rivers; herring and mackerel off Bergen, Stavanger and Christiania, on the south-west coast; while further north enormous quantities of **cod** are caught off the Lofoten Islands, especially in the Vest fjord, between the archipelago and the mainland. The cod finds its food on the banks near these islands, and at least 80,000 fishermen are engaged during the fishing season. Cod, either fresh or salted, is used largely for food; the oil from the liver is prepared as a medicine, and the roe is used as bait for other fisheries. **Bergen** has the largest export trade in fish, and it sends immense quantities to the markets of the Roman Catholic countries of the Mediterranean region. Ice, cut from the glaciers, is used for packing fish, and cargoes of ice are also sent to British ports as a separate export.

The total value of the fisheries is, however, not half that of the forest products. **Shipbuilding** has always been an important industry, and Norway now possesses a fine mercantile fleet of wooden ships. Large quantities of **timber** are exported (especially pine wood), while wood pulp for paper-making has now become an important article of commerce.

Agriculture is carried on in the lowlands round Christiania fjord and Lake Mjosen, and in the lower Glommen valley, but cereals (especially rye) have to be imported. Barley can be cultivated so far north as latitude 70°, but although the climatic conditions are favourable, the character of the country makes profitable cultivation impossible.

Christiania, at the head of Christiania fjord, is the only large city; it is surrounded with hills, beautifully wooded, while the fjord is studded with tree-clad islands. Christiania has not only good water communication, but it also has railways to Bergen, Trondhjem, Stockholm, Göteborg, and other centres. Since the union with Sweden was dissolved in 1905, Christiania has once more become the capital of an independent kingdom.

Trondhjem, famous for its old cathedral, in which the kings

of Norway are crowned, is a great tourist resort during the summer months.

The only places of importance inland are Hamar, on Lake Mjosen, the centre of an agricultural district, and the mining towns, Kongsberg (silver), Roros (copper), Eidsvold (gold).

EXERCISES.

1. The average values of the chief imports into the United Kingdom per annum from Sweden and Norway respectively are given below.

BRITISH IMPORTS FROM SCANDINAVIA.

Articles.	Sweden.	Norway.
	In £1000.	In £1000.
Timber and Wood,	3,529	1,501
Wood Pulp,	1,619	1,349
Matches,	352	43
Iron Ore,	313	—
Butter,	1,839	149
Fish,	61	763
Ice,	—	160

Write out a list of the articles in order of values for (*a*) Sweden, (*b*) Norway. What is wood pulp? What is manufactured from it? What materials are required for the manufacture of matches?

Why does Sweden produce more butter than Norway? Why is Norway superior to Sweden in the export of fish? What kinds of fish are exported? What kind of ice is exported from Norway?

2. Five towns in Norway and twelve towns in Sweden have more than 20,000 inhabitants.

CHIEF TOWNS OF SCANDINAVIA.

Norway.	Popn. 1000.	Sweden.	Popn 1000.	Sweden.	Popn. 1000.
Christiania,	244	Stockholm,	342	Örebro,	29
Bergen,	77	Göteborg,	164	Eskilstuna,	28
Trondhjem,	45	Malmo,	81	Carlskrona,	27
Stavanger,	37	Norrköping.	45	Upsala,	25
Drammen,	25	Helsingborg,	32	Jönköping,	25
		Gefle,	32	Boras,	21

(*a*) Mark these towns on a sketch map of Scandinavia.
(*b*) What do you notice about the distribution of these towns? In what part of Scandinavia are they situated? Can you account for this?

Why are Stockholm, Christiania and Göteborg so much larger than the other towns of Scandinavia?

EMIGRATION.

	Norway.		Sweden.	
	Total number of Emigrants.	Emigrants to U.S.A.	Total number of Emigrants.	Emigrants to U.S.A.
1904	22,264	20,840	22,380	18,530
1906	21,970	20,450	24,700	21,240
1908	8,500	7,850	12,500	8,870

Why do so many people emigrate from Norway and Sweden every year? Why do most of them go to the United States? What percentage of emigrants went to U.S.A. in 1904, 1906 and 1908 respectively?

LESSON VII.

EASTERN SCANDINAVIA.

1. From the numbers given below, find the population per square mile of Norway, Sweden, England and Wales respectively. Draw a square (with sides two inches long) to represent one square mile; in it put dots to represent the number of people in Norway to every square mile. In the same way represent the population per square mile (*a*) of Sweden; (*b*) England and Wales.

What percentage of the population of (*a*) Sweden; (*b*) Norway, lives in the towns?

AREA AND POPULATION.

	Area in square miles.	Total Population. 1000.	Town Population. 1000.
Norway, - - -	124,130	2,392	691
Sweden, - - -	172,876	5,476	1,335
England and Wales, -	58,324	36,075	—

2. On an average Sweden produces every year:

MINERAL PRODUCTIONS.

	1000 tons.		1000 tons.
Iron Ore, - - -	4,300	Manganese Ore, -	5
Silver and Lead Ore,	2	Sulphur Pyrites, -	23
Copper Ore, - -	15	Coal, - - -	276
Zinc Ore, - - -	42		

Draw a line one inch long to represent 20,000 tons. Then draw a series of lines to the same scale to represent the quantities in the above table.

Which line will be too long for your note-book? What would its length be?

3. Find on the map the position of Skudesnaes and Stockholm. Draw a diagram, similar to the one on p. 210, and mark the temperature curve and vertical columns for the rainfall for each month. Under the diagram write the rainfall (annual).

TEMPERATURE AND RAINFALL, 1910.

	SKUDESNAES.		STOCKHOLM.	
	Average Temperature.	Rainfall.	Average Temperature.	Rainfall.
	Fahrenheit.	In inches.	Fahrenheit.	In inches.
January, -	35·2°	3·80	28·5°	1·38
February, -	37·6	4·75	31·4	1·92
March, -	37·8	1·95	33·2	·44
April, - -	41·9	4·77	47·3	1·15
May, - -	51·6	3·0	51·6	3·52
June, - -	56·8	3·87	60·3	1·79
July, - -	57·1	1·03	59·2	5·48
August, -	59·8	7·61	58·5	1·58
September, -	54·1	2·34	52·3	1·95
October, -	47·5	3·18	42·8	·88
November, -	43·9	7·42	32·9	2·92
December, -	39·6	4·46	32·6	1·36

4. Railways of Scandinavia :

(1) Stockholm via Nörrköping (*a*) to Malmo for Copenhagen ; (*b*) to Trelleborg, thence to Sassinitz (Rugen), and on to Berlin.
(2) Stockholm to Göteborg (the railway passes between Lakes Wener and Wetter).
(3) Stockholm to Christiania via Karlstad.
(4) Stockholm via Bräcke (*a*) to Trondhjem ; (*b*) to Lulea.
(5) Lulea via Gellivara to Ofoten Fjord.
(6) Christiania to Trondhjem via the Glommen Valley.
(7) Christiania to Bergen.

On an outline map of Scandinavia mark roughly the railways given above. Place the railway map by the side of the contour map, and examine the relation of the railway routes to the physical features.

Sweden.—The main watershed of Scandinavia runs from north to south at no great distance from the Atlantic coast, and the rivers as a rule flow in a south-easterly direction towards the Baltic. The hard rocks of Sweden have been worn into parallel valleys by glacial action, and in these valleys are long, narrow lakes, similar to those in the Highlands of Scotland. In Southern Sweden a low-lying plain stretches across the country from the Baltic to the Cattegat ; on this plain are the great lakes **Wener** and **Wetter**, which, with **Hjelmar** and **Malar**, probably once formed a direct outlet from the Baltic to the North Sea, and now help to form the waterway from Stockholm to Göteborg. To the south of this lake district is a hilly country, in which, however, the heights rarely exceed a thousand feet.

In the elevated parts of Sweden, ancient rocks appear bare, or covered with scanty soil ; on the lower slopes the old rocks are hidden with glacial formations—boulder clay, gravel and sand. In the provinces of **Scania** and **Gotland** are the most fertile soils, and here **agriculture** is chiefly carried on, rye, oats, barley, beet and potatoes, being the most important crops, while dairy-farms in the same districts produce butter for export.

In all parts of the country, however, trees grow abundantly, more than fifty per cent. of the entire area of Sweden being covered with forests—**pine** and **fir** trees grow everywhere, oaks in central Sweden and beeches in the south.

Shut off from the Atlantic by lofty mountains, and exposed to cold winds from the east and north, Sweden, like Russia, has a **continental climate.** Lakes, rivers, canals and harbours, all freeze in the winter; the greater part of the country is covered with snow, over which people can go on ski, or long snow-shoes; while skaters, holding up sails to catch the breeze, can be driven by wind-power at a rapid pace across the ice. During the winter, timber is dragged over the snow and ice; in summer it is floated down the rivers and across the lakes to the saw-mills, or to the coast. There are at least 5,000 saw-mills in the country, and they are nearly all driven by water-power. Timber is used for shipbuilding, window-frames, wood pulp, matches and fuel, while sawn timber, piled high on the decks of wooden ships, is carried in great quantities to German and British ports.

Sweden is very rich in **minerals**, especially iron and copper; very little coal is found, hence water-power is more important than steam-power. Most of the iron ore obtained from Dannemora and Gellivara is sent to be smelted on British coalfields, but every year a small quantity is smelted with charcoal at Dannemora.

Towns.—All the large towns of Sweden are situated south of latitude 60° N. **Stockholm,** the capital, at the entrance of Lake Malar, owes its commercial importance to its water-communication. In summer, goods are exported via the Baltic Sea, or by the canals and lakes to **Göteborg**; in winter by railway to **Trondhjem,** an ice-free port. Woollen and cotton fabrics are now manufactured at Stockholm and at **Nörrköping.**

Upsala is noted for its university. Göteborg, on the Cattegat, is well situated for North Sea trade and **Malmo** for Danish trade.

North of latitude 60° N. are many small ports such as **Gefle,** noted for the exportation of timber and copper ore (from Fahlun), and Lulea for timber and iron ore (from Gellivara).

EXERCISES.

1. Examine the table on p. 41. Compare the climate of Skudesnaes with that of Stockholm as regards temperature and rainfall. What type of climate prevails at (*a*) Skudesnaes; (*b*) Stockholm? Account briefly for the climate of each.

2. Compare the east coast of Scandinavia with the west coast as regards structure, climate and trade.

3. Show that the physical features of (1) Norway, (2) Sweden have influenced the inhabitants as to their habits and occupations.

4. On an average Sweden imports annually the following articles from the United Kingdom:

SWEDEN'S IMPORT FROM THE UNITED KINGDOM.

	Value in £1000.		Value in £1000.
Coal, - - -	2,384	Woollen Goods, -	124
Iron and Steel Goods,	476	Machinery - -	233
Cotton Goods, - -	380		

Comment on the above imports. How is it that coal is Sweden's greatest import?

Compare Sweden's imports, given above, with the exports given in the table on p. 39.

LESSON VIII.

BALTIC PROVINCES OF RUSSIA.

1. Area of Finland, 125,784 square miles; population, 3,016,000; number of emigrants (in 1908), 5812.

Find (*a*) the population per square mile, (*b*) the percentage of the population which emigrated in 1908.

Draw a square (sides 2 inches) to represent one square mile; in the square mark a number of dots to show the density of population of Finland.

Draw, to the same scale, a similar diagram to represent the density of population of Norway (see p. 40).

2. Measure from the map (*a*) the length of the coast line of Finland,
(*b*) the distance of the following towns from St. Petersburg: Helsingfors, Revel and Riga.

3. Draw a sketch map of the Gulfs of Finland and Riga; mark the seaports, the railways connecting them, and the chief articles exported from each.

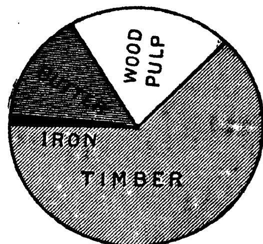


FIG. 10.—Diagram to show the proportions of the exports of Finland.

4. If a circle (radius one inch) be drawn to represent the total value of the chief exports of Finland, namely, 206,427 thousand marks (see below), then sectors of the circle may be drawn to represent the proportions of the chief exports. In order to do this, find the proportion of each class of exports by taking 360 to represent the total value. Then mark off on the circle the nearest whole number of degrees for each by means of a protractor. For example, in the case of Finland, the proportions would be:

Timber, - - . -	227
Wood pulp, - - -	74
Butter, - - - -	55
Iron ore, - - - -	4
Total, - - -	360

5. Make a similar diagram for the imports of Finland (see p. 48). As the value of the imports is about eight-tenths that of the exports, the radius of the circle should be about 0·8 inch.

Finland.—From the contour map (Fig. 15) it will be seen that from the Gulf of Finland there stretches northward to the Arctic Ocean a region in which the elevation rarely exceeds 500 feet. This region, in area nearly four times that of England, consists almost entirely of granite and other igneous rocks. During the glacial period the rocks were scratched and polished by ice. Scattered over the country are great boulders, which were brought by glaciers and deposited in their present

positions; these are known as **erratic blocks.** The upstanding granite ridges, the glaciated valleys (containing long lakes) and the chains of boulders run in a north-west to south-east direction. This direction is parallel to that of the valleys of Sweden which reach the Gulf of Bothnia. Lakes, lagoons and marshes cover a large part of Finland. Rivers join the lakes together; rapids and waterfalls abound. **Imatra,** the finest cataract, is in a granite gorge in the course of the Vuoxen.

Sedimentary rocks (that is rocks formed by deposits on the beds of lakes, rivers or seas) stretch southwards from the Gulf of Finland, and they surround the Gulf of Riga. These rocks also have been subject to glaciation, and here are the shallow lakes Peipus and Ilmen. To the east of the Gulf of Finland is **Lake Ladoga,** the largest lake in Europe, the area of which is 7,000 square miles (about the same area as Wales), and the average depth 300 feet. The north-west coast of Lake Ladoga is high and rocky, the south and east coasts are low and marshy. Water enters the lake from Onega, Saima and Ilmen, while the overflow is carried off by the River Neva into the Gulf of Finland. From May to October Ladoga is free from ice, but during those months strong winds sweep across it, making navigation dangerous; the danger is further increased by shallows, sandbanks and sunken rocks. It was therefore necessary to construct the Ladoga Canal (70 miles long), along the southern shore, to carry goods to and from St. Petersburg.

Wherever he goes the traveller in Finland sees nothing but lakes, rocks, pine forests and desolate tracts of low-lying marshland and moorland, while the dull northern sky increases the general gloom of the landscape; in winter, a covering of snow and ice makes the scenery even more monotonous. Here and there the forest land has been cleared, or the marshland has been drained in order to gain tracts for cultivation. Agriculture is the chief occupation of the people, but the cultivated area is restricted owing to the physical condition of the country. In Finland dairy-farming has recently become important, and the exportation of butter is increasing year by year; Hango has the chief export trade in butter. **Helsingfors,** the capital of Finland,

is situated on a peninsula surrounded by islands and rocky cliffs, and is protected by the fortifications of Sveaborg. Its trade is chiefly with England; and its exports are timber, wood pulp and agricultural produce. A railway from Helsingfors passes through granite cuttings to **Viborg**; this town has good water communication from the coast to the interior. **Abo**, the oldest town in Finland, is conveniently situated for trade near the entrances of the Gulfs of Bothnia and Finland.

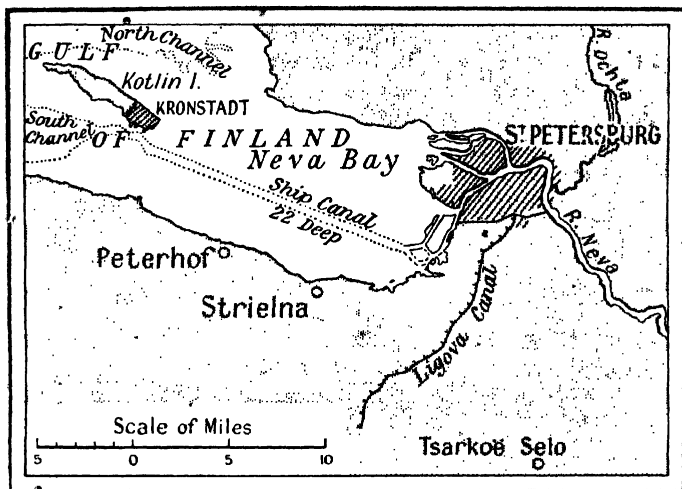


FIG. 11.—ST. PETERSBURG AND THE SHIP CANAL.

St. Petersburg, the modern capital of Russia, was founded by Peter the Great in 1703, amid the marshes at the mouth of the River Neva. Since then it has been the headquarters of the Czar's autocratic government, and consequently thousands of soldiers and officials are stationed there. The great population of St. Petersburg (1,550,000) is, however, largely due to the facilities which the city possesses for trade. Canals connect the Volga with the Neva, by means of which 20,000 boats and rafts reach St. Petersburg every year, bringing corn, hemp,

flax, linseed, leather, timber. A deep canal now enables nearly 2,000 ships from the Gulf of Finland to reach the city, although it is only free from ice for about 220 days in the year. These ships, mostly flying foreign flags, bring coal, machinery and manufactured goods into St. Petersburg. Four main lines of railway radiate from the city. On an island 20 miles west of St. Petersburg is the fortified naval port of **Kronstadt.**

Revel, the capital of the province of Esthonia, exports oats, spirits and flax. Its harbour is used as a naval station.

Riga, the capital of Livonia, was annexed by Russia in 1710. It is now the third port in Russia, ranking next to St. Petersburg and Odessa. It stands seven miles from the mouth of the Duna, and is an outlet for the timber of the Russian forest belt; for flax, hemp, rye of the cultivated lands in the Baltic provinces; its trade is chiefly with England. Half the people of Riga are of German origin.

EXERCISES.

1. The chief exports and imports of Finland for one year are given in the following table :

FOREIGN TRADE.

Exports.	Value in 1000 marks.	Imports.	Value in 1000 marks.
Timber, - - -	134,129	Cereals, - -	85,227
Wood Pulp, - -	42,519	Machinery, -	22,280
Butter, - - -	30,445	Iron Ware, -	18,669
Iron and Iron Goods,	2,358	Coffee, - -	15,586
		Sugar, - -	14,572
		Cotton, - -	14,391

Comment on the above table. Show the relation of these articles of trade to the physical condition of the country. The value of a mark is 9½d.; find the value of the iron ore in pounds sterling. Use the result as a factor to find roughly the values of the other articles in the table.

2. Examine the map of Finland. What percentage of the area of the country is covered with water? Explain the presence of so many lakes.

3. Give an account of St. Petersburg as a political capital, a commercial port, and an industrial centre.

4. Say what you know of the acquisition by Russia of a Baltic coast-line. To what races do the inhabitants of the Baltic provinces of Russia belong?

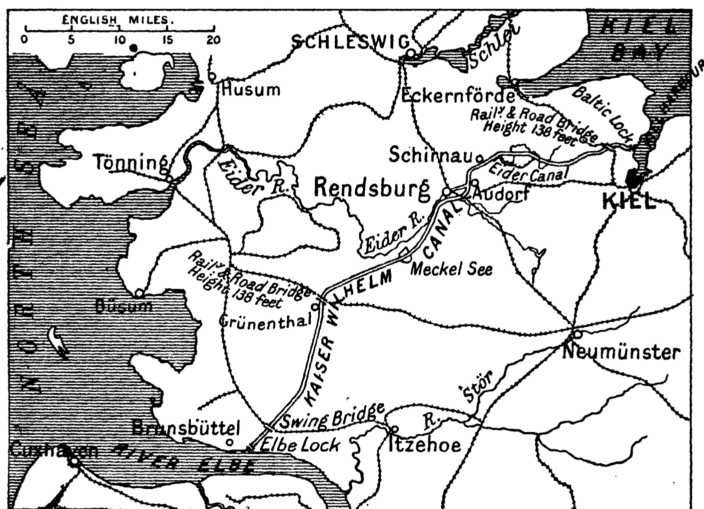


FIG. 12.—THE KAISER WILHELM (OR KIEL) CANAL.

LESSON IX.

BALTIC COAST OF GERMANY.

1. Trace from Fig. 13 the coast-line, rivers, and contours. Shade the land which is over 300 feet high, and mark as far as you can the areas of vegetation and cultivation.

2. The Kaiser Wilhelm (or Kiel) Canal. Length, 61 miles; breadth, 213 feet at the surface, 72 feet at the bottom; depth, 29½ feet. Cost of construction, £7,800,000. For the year

ending March, 1910, 38,547 vessels of 6,527,700 tons net passed through the canal.

Examine (Fig. 12) the Kaiser Wilhelm Canal, and measure its length.

From the figures given above draw to scale (*a*) a section of the canal to show its length and depth, (*b*) a cross-section (to the same scale) where the railway bridge crosses near Grünenthal.

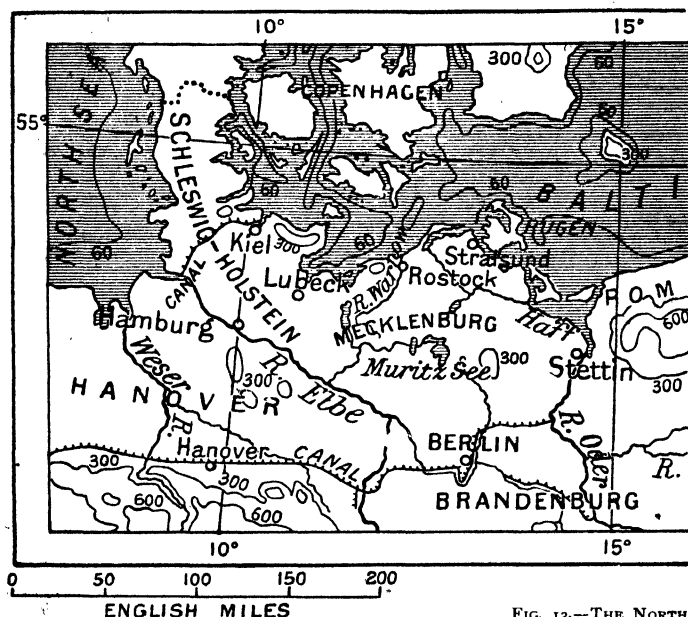
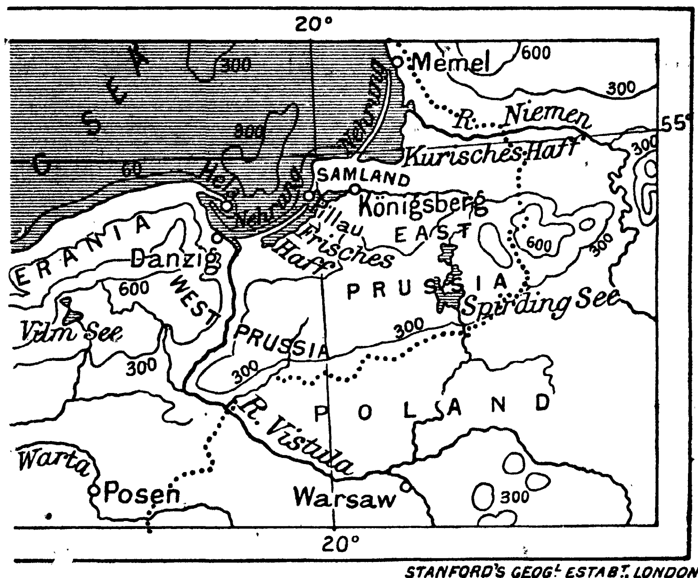


FIG. 13.—THE NORTH

The North German plain forms part of the Central plain in Europe. The soft formations of clay and sand form a striking contrast to the hard surface features of Finland and Scandinavia. As the ice sheet, which once extended from Scandinavia over the German plain, gradually melted it left the surface of the plain covered with morainic deposits in the form of **stiff clay**. Here and there masses of granite or of gneiss, brought from

Sweden, are found scattered over the plain—these **boulders** are similar to the erratic blocks of Finland. The ridge, just south of the Baltic coast, is also of morainic origin, and through it the Vistula, Oder, and other rivers cut their way to the Baltic. In the depressions of the plain lie many reedy lakes, such as the Muritz See, Vilm See and Spirding See, and they relieve to some extent the monotony of the landscape. The chalk cliffs



GERMAN PLAIN.

of Rugen and the limestone hills of Rudersdorf are examples of older rocks which rise through the more recent formations of clay and sand.

The Baltic coast-line of Germany is low and sandy; it is remarkable, however, for several openings, to which the term **haff** is applied. The formation of a haff was probably due to a subsidence of the land, and by a building up of a long bar of

sand called **nehrung**; the bar was caused by the eastward sweep of the waves on one side and the pressure of river water on the other: the Frisches Haff was formed in this way in the sixteenth century. Between the Frisches Haff and the Kurisches Haff is the slightly elevated **Samland**, from which amber is obtained. The water at the mouth of the River Oder is not a haff in the above sense, but is simply water enclosed by islands.

Natural Vegetation.—The trees which grow best on the plain are beeches; they thrive in Rugen and on the coast-lands as far east as Königsberg; pine and birch flourish on the sandier soils of East Prussia. There are, however, no extensive forests like those of Bavaria—in fact, timber has to be imported from Scandinavia and the United States to supply the needs of Northern Germany.

The flat lands of Schleswig-Holstein are swept by winds from the sea, hence trees do not flourish, but **grass-lands** extend not only in this province but also in the adjoining duchy of Mecklenburg. Horses and cattle are pastured in great numbers, and **dairy-farming** is one of the chief occupations of the people. The best horses for cavalry regiments are, however, reared in N.E. Prussia.

In consequence of the competition of foreign wool there are now fewer sheep than formerly, as arable land pays better than sheep-runs, but pigs in increasing numbers are being fed cheaply on acorns, beech nuts, or the refuse from the sugar beet.

Agriculture.—More than half the people on this plain depend on agriculture for a living; in spite of the poorness of the soil and rawness of the climate, scientific farming has made the land very productive. Rye and oats are the chief grain crops, but a sufficient quantity cannot be grown, hence cereals have to be imported from Russia. On the other hand, **potatoes** are grown in the light sandy soils in such enormous quantities that part of the crop is exported every year. In Germany, potatoes are used not only for food, but also for the distillation of spirit.

Beet is extensively grown in the river valleys, for the extraction of sugar and for the distillation of spirit. The Prussian govern-

ment encourages the production of beet sugar by giving bounties to the manufacturers; as a result of this the production has increased to such an extent that Germany is able to manufacture twice as much beet sugar as she requires for her own consumption.

Berlin, the capital of Germany, is situated on the River Spree; its position on the North German plain has largely assisted its commercial development. Canals, joining the

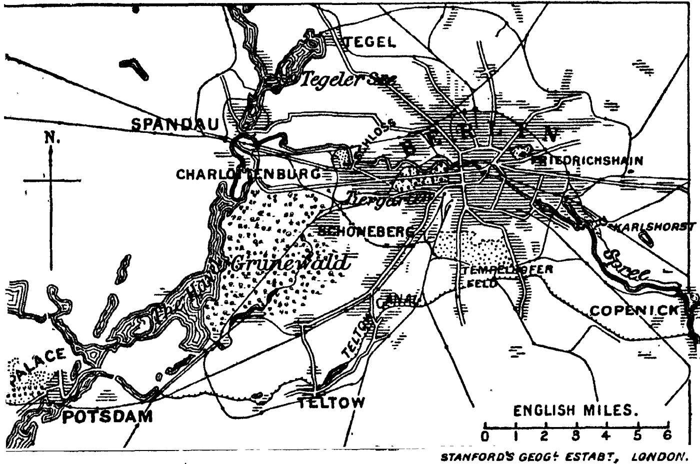


FIG. 14.—BERLIN AND NEIGHBOURHOOD.

Elbe and Oder, provide Berlin with a means of cheap transport and railways connect it with the chief cities of Europe. The manufacture of clothing, fancy goods, and other articles gives employment to a large part of the population.

The Baltic ports of Germany are almost all near the mouths of rivers, which gives them access to the sea, while they also have water communication with the interior. The waterways from the sea are, however, not deep enough for modern shipping; in spite of dredging, many ships are unable to approach some of the towns, hence outports have grown up on

the coast itself. For example, **Königsberg**, on the Pregel, is 28 miles from Pillau, its outport, the Frisches Haff being too shallow for sea-going vessels. Königsberg has 173,000 inhabitants, and is the largest Prussian town connected with the Baltic. It is a distributing centre for North-East Prussia, and trades largely in wheat and tea.

Danzig is on one of the mouths of the Vistula; timber and wheat are brought down the river to this port from Poland. **Stettin**, on the Oder, is 30 miles from Swinemünde and 60 miles from Berlin; it has river communication with Ratibor in Silesia, and canals connect it with the other rivers of Northern Germany. Stettin is noted for shipbuilding, oil refining, beet sugar and distilling.

Rostock, seven miles from the mouth of the Warnow, is one of the busiest of the Baltic ports; it has a fair for horses, cattle, and wool, while its chief industries are shipbuilding, tanning and distilling.

Lubeck is on the Trave; goods from Hamburg to the Baltic pass through it. In the middle ages Lubeck was more important than it is now, for it was the chief of those German cities which formed the Hanse League for the protection of commerce.

Kiel, in Schleswig-Holstein, is near the Baltic entrance of the Kaiser Wilhelm Canal. It is a fortified naval station, and noted for its shipbuilding yards.

Memel, at the mouth of the Kurisches Haff, has a large harbour, and exports timber, flax and linseed.

EXERCISES.

1. From the map traced in Exercise 1, p. 49, show the relation of the land to the river valleys and to the canals.

How were uplands on this plain formed?

2. Explain the meaning of the terms *see*, *haff* and *nehrung*. How were these features formed?

3. Compare the Kaiser Wilhelm Canal and the Suez Canal as regards position and commercial importance.

4. State the advantages and disadvantages which the Baltic ports of Germany possess as regards position for sea trade and inland communication.

PART III.

THE CENTRAL PLAIN.

LESSON X.

RUSSIA—PHYSICAL FEATURES.

1. From the map (Fig. 15) measure in miles the length of the Volga. If you imagine the water to flow down an even slope, and in a direct course from the Valdai Hills to Astrakhan, represent the slope of the river bed in a diagram, using a vertical scale of $\frac{1}{10}$-inch for 100 feet, horizontal scale the same as the map.

2. Mark on a contour map a route for a ship-canal:

(*a*) from the Baltic to the Black Sea;

(*b*) from the Black Sea to the Caspian.

In each case the route chosen must reach the least possible elevation. Mark in feet the highest point on each route.

3. Show by means of diagrams the variation in the length of day and night at Sevastopol and Archangel respectively (*a*) on the longest day; (*b*) on the shortest day of the year (see p. 243).

4. Draw sections, using a vertical scale of $\frac{1}{10}$-inch for 300 feet:

(*a*) along longitude 50° E.;

(*b*) along a line joining Minsk with the Valdai Hills, and produced each way to the Russian frontier.

5. Draw a sketch map of the Caspian, and shade the area that would be covered with water if an open water-course joined the Sea of Azov with the Caspian Sea.

6. From a contour map find the height above sea-level of the following places: Moscow, Odessa, Astrakhan, Zlatoust, Warsaw, Tula, Minsk, Tver. What is the difference in elevation of Tsaritzin and Kalach?

7. Use a piece of transparent squared paper to find roughly the areas of Lake Ladoga, the Crimea, and the Black Sea.

Physical Features.—Russia, the area of which is almost half that of Europe, forms part of the great European plain. Although Russian territory touches four seas there is no satisfactory outlet to the ocean The Arctic coast is ice-bound for the greater part of the year; the entrances of the Baltic are guarded by Denmark and Sweden; Constantinople commands the Bosporus, while the Caspian is land-locked.

A very small part of Russia reaches an elevation of 1,000 feet; the greater part of it is less than 600 feet, while the Caspian district is below sea-level. Between the Sea of Azov and the Caspian is the Manych depression, in which the land only rises 14 feet above sea-level. The most important watershed in Russia runs across the country from the Urals (about lat. 62° N.) through the plateau of Minsk and the Valdai Hills to the Carpathians; this watershed separates the rivers flowing into the Arctic Ocean and Baltic Sea from those flowing into the Black Sea and Caspian. The less important watersheds are formed of gentle swellings of the surface which do not, however, interrupt the general flatness of the country.

The **Volga**, in flowing from the Valdai Hills to the Caspian, falls on an average only about six inches in every mile, consequently its current is exceedingly slow. Slowness is a characteristic feature of all Russian rivers; and one advantage of this is that river traffic is able to travel up-stream as well as down, wherever there is a sufficient depth of water. The rivers are full of water in spring when the snows are melting, and again after the autumn rains. During the summer months evaporation goes on very rapidly and navigation is rendered difficult in some places. All Russian rivers, however, are

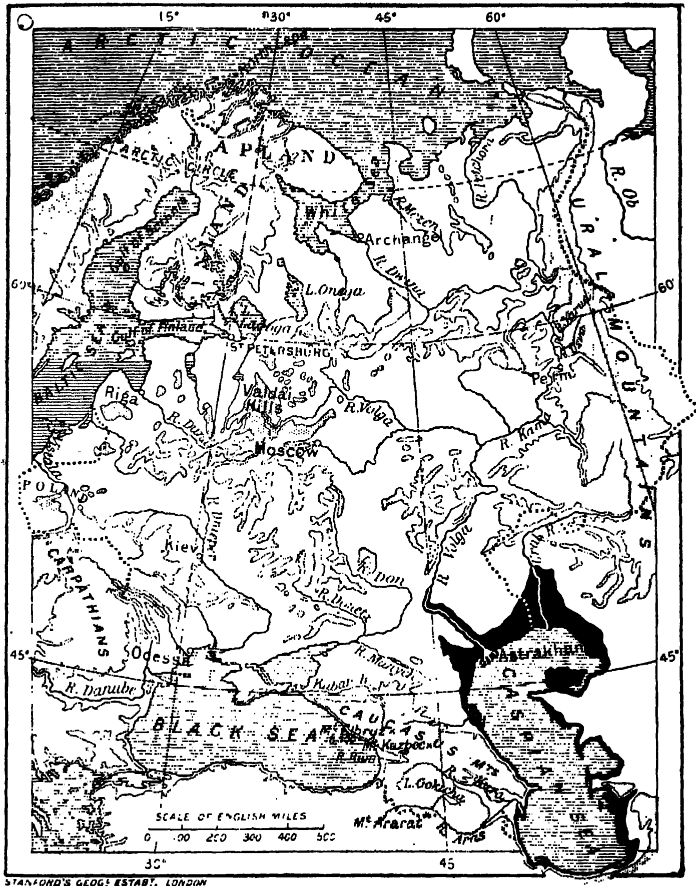


FIG. 15.—CONTOUR MAP OF RUSSIA.

The lightly-shaded areas are more than 600 feet in height. The Caspian Sea is 84 feet below sea-level.

frozen during five or six months in winter, and navigation is then at a standstill.

The **Dnieper** is obstructed by rapids near Ekaterinoslav; the **Don** has many shallow reaches, and is only really navigable in flood time, while its tributary, the **Donetz**, has almost ceased to be navigable, in consequence of the destruction of the forests which once covered the surrounding country (cf. p. 63).

The flat nature of the country made the construction of **canals** an easy matter, and as the rivers approach each other at many points short canals only were required to unite the rivers into a perfect network of waterways. Goods can be carried by water from the Caspian to Baltic ports, for the Volga is connected with the Neva by three canals. The Dnieper and Düna with canals connect the Black Sea and the Baltic. Although the Volga at Tsaritzin is only 55 miles from the Don at Kalach, there is a great difference of level, and so goods have to be carried by rail from one river to the other.

Roads.—Before the advent of railways, the public roads were objects of Government care, and many good roads were constructed, such as the macadamized road from Moscow to St. Petersburg. The country or farm roads, however, are made of soft materials, and along them agricultural produce is carried to the nearest town or railway station; in wet weather these roads become almost impassable, and even in the province of Moscow it is not unusual for a village to be cut off from the outside world during a rainy autumn, or during the break-up of the frost in spring. In the winter, goods are carried on sledges over the frozen snow.

Climate.—As Russia is situated at a considerable distance from the Atlantic, its climate is **continental** in character; the chief features of the climate are hot summers, cold severe winters, sharp changes in the weather and an irregular and unequally distributed rainfall. The further east a place is, the more marked are the continental conditions: the summer gets shorter and hotter, the winter gets more inclement and prolonged. The summer isotherms run from west to east or north-east; while the winter isotherms run to the south-east, connecting, for example, the cities of Pskov and Astrakhan. With regard to rainfall, the north-west areas have the most

extended rains, while south-east of a line drawn from Odessa through Saratov to Orenburg, the districts are subject to short storm showers, which only deposit rain over small areas. To the north of latitude 60°, August is the most rainy month; between latitude 50° and 60° it is July; in the south, June.

In central and northern Russia, south-westerly winds prevail in winter, while westerly winds prevail in the summer. In the

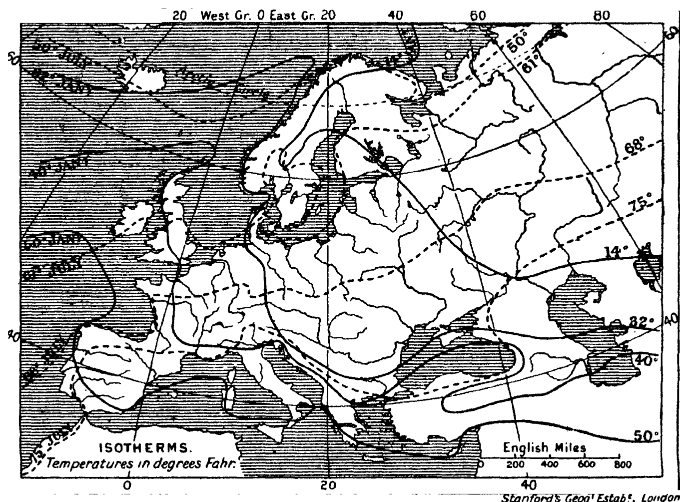


FIG. 16.—EUROPE: ISOTHERMS FOR JANUARY AND JULY.

southern parts of Russia, dry easterly winds frequently blow in the autumn, winter, and early spring; from May to August south-westerly and north-westerly winds blow, and these bring some moisture.

Soil.—As regards soil Russia may be divided into two regions: (*a*) the northern with turf-peat soils; (*b*) the southern with black earth soils.

The **turf-peat soils** extend as far north as the tundras or polar marshes; they consist chiefly of clay, sand and fuller's earth;

and they are favourable rather to the growth of forest trees than to the cultivation of crops.

The **black earth soils** are distinguished for their capacity for absorbing and retaining moisture; this characteristic compensates for the scarcity of the rainfall, which in this region is only about 18 inches a year. About one-fifth of Russia is covered with black earth.

Between these two important soils is a narrow belt in which the turf-peat soil seems to encroach on the black-earth soil; here forest vegetation occurs especially along the river banks.

In addition to the soils referred to above the **saline soils** of the Caspian region must be mentioned.

EXERCISES.

1. The Ural, Caucasus and Carpathian Mountains are situated near the borders of European Russia. Describe the position of each range with regard to the political boundary near it.

2. Mention four important Russian rivers. Show in what way they are useful to the people of Russia, and point out any disadvantages which they possess.

3. Write in tabular form (*a*) the right bank and left bank tributaries of the Volga, Don and Dnieper;

(*b*) any Russian towns which stand at the confluence of rivers.

4. Examine Fig. 16 and from it describe:

(*a*) the course of isotherm 32° for January and the temperature conditions which prevail east and west of the line;

(*b*) the course of isotherm 68° for July and the temperature conditions which prevail north and south of the line;

(*c*) the climatic conditions which prevail in January and July respectively at Moscow, Yalta (Crimea) and the south coast of Iceland.



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FIG. 17.—A SAMOYE ES CAMP IN NORTHERN RUSSIA.

LESSON XI.

NATURAL REGIONS OF RUSSIA.

1. The following table gives the governments or provinces of Russia containing the smallest average population and those which contain the greatest :

RUSSIA—DISTRIBUTION OF POPULATION.

Government or Province.	Density per square mile.	Government or Province.	Density per square mile.
Perm, - - -	28	Moscow, - -	247
Orenburg, - -	27	Poltava, - -	186
Astrakhan, - -	13	Kursk, - - -	164
Vologda, - -	10	St. Petersburg, -	164
Olonetz, - -	9	Poland, - - -	238
Archangel, - -	1	Warsaw, - -	360
Podolia, - -	229	Petrokov, - -	381
Kiev, - - -	226		

On a map of Russia mark the names of the provinces given above, with the density of population. Shade the areas you have marked (accurate boundaries are not required), and note on the map any reason which accounts for the density or thinness of the population.

2.

RUSSIA—DISTRIBUTION OF LAND.

Nature of Land.	European Russia.	Poland.
	1000 acres.	1000 acres.
Arable, - - -	401,400	17,740
Grazing Land, -	191,500	6,000
Forests, - - -	474,000	6,700
Waste, - - -	92,500	1,400

Find the total number of acres (*a*) in European Russia, (*b*) in Poland. Find the percentage of arable, grazing, forests and waste land for Russia and Poland respectively.

On a sheet of squared paper (in tenths of inches) shade a strip ten inches long and two-tenths wide. Let this represent the total area of European Russia. Draw similar strips to show graphically the different kinds of land given in the table.

Russia may be divided into the following natural regions:

(1) **The Tundras**, which extend along the margin of the Arctic coast, are great stretches of low-lying **marsh-land**; they are frozen for the greater part of the year, and they can then be crossed by sledges drawn by reindeer, but during the short summer they are almost impassable; mosses, lichens, and stunted shrubs are the only vegetation. The few inhabitants are engaged in fishing and hunting. The polar bear, walrus and seal are met with on the coast, while salmon and trout are caught in the rivers.

(2) **The Forest Belt** covers one-third of the whole country, comprising Poland and the area between latitude 55° N. and 65° N. In the northern part of the belt, **coniferous forests** predominate, the chief trees being fir, pine, and larch; in the southern part of the belt, **deciduous trees** abound, viz. oak, birch, elm, beech, maple, ash and others. During the last fifty or sixty years so much land has been cleared of forests that the climate has become drier in some districts. The volume of water in the rivers has diminished, while some cultivated districts have suffered from drought. The Government is now controlling both the cutting down and the planting of trees.

From the forests are obtained many products, **timber**, resin, potash, turpentine and wood pulp, while animals that live in the forests, such as the bear, silver fox, ermine and sable, are hunted for the sake of their furs. The timber from this region is exported chiefly from Riga, St. Petersburg, Helsingfors, Revel, and Libau on the Baltic, and from Archangel on the White Sea.

In the cleared lands of the forest belt, especially in Pskov, Livonia, Tver, and the Lake Region, **flax** is grown for fibre from which linen is made; while rye, oats, barley and potatoes are extensively cultivated.

(3) **The Black Earth Region** is the source of Russia's greatest wealth. A line drawn from Kiev to Ufa bounds the

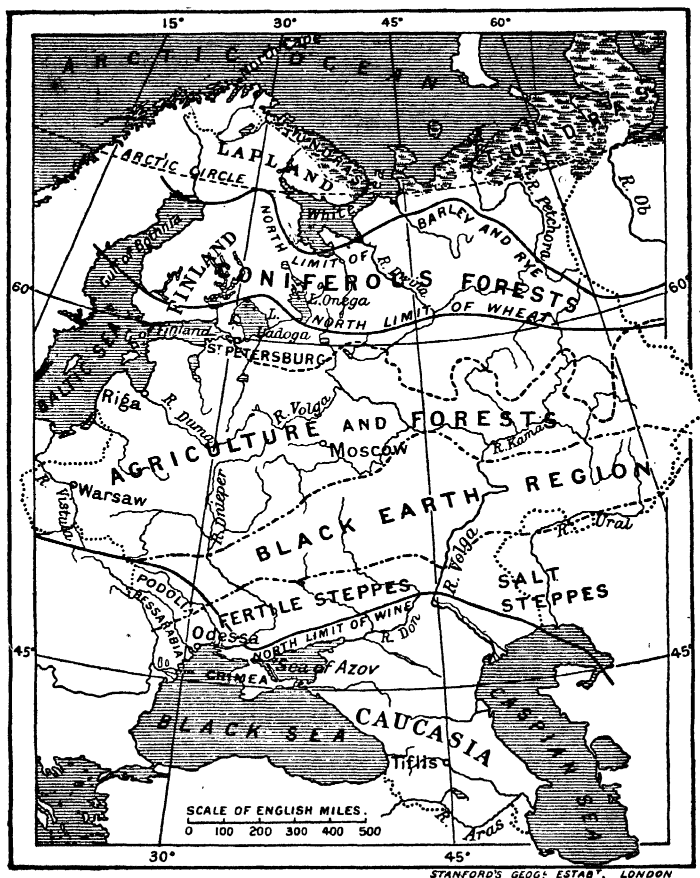


FIG. 18.—THE NATURAL REGIONS OF RUSSIA.

region on the north, and a line from Ekaterinoslav to Orenburg bounds it on the south. The most valuable crop is **wheat**, ar

account of which is given below. **Flax** is grown in this region for the sake of the seed from which linseed oil is obtained. **Hemp** produces fibre for ropes and seed for oil; and in the Volga valley, near Saratov and Samara, sunflowers are cultivated for the oil in the seeds. **Beet** is grown in the western part of the region for the production of sugar; the largest refineries are at Kiev. **Tobacco** is grown throughout the region, but especially near Poltava and Samara.

(4) **The Fertile Steppes**, lying between the rivers Pruth and Don, slope down to the Black Sea and Sea of Azov. This region is warmer than other parts of Russia; the summer is hot and dry and the winter lasts only about three months. The black earth gradually gives place to sand, clay and salt plains. The density of population decreases in an easterly direction. In the south-west part, viz. Bessarabia, Podolia, and Kherson, **maize** is extensively cultivated for exportation. **Wine** is grown in large quantities on the hills overlooking the Dniester valley and on the southern slopes of the mountains of the Crimea. This latter district is the Russian Riviera and it is well sheltered from north winds; Yalta is a noted health resort.

On the sandy soils, which stretch from the lower Dnieper to the Don, are grazing lands for countless **horses, cattle,** and **sheep.** The chief products are therefore hides, leather, hair and bristles. This district is the home of the **Cossacks**, the finest horsemen in Russia. **Kharkov**, on the edge of the grass-lands, is noted for its horse fair.

(5) **The Sterile or Salt Steppes.**—The eastern part of the Black Earth region is so arid that it becomes steppe land. Stretching southwards to the Caspian the land is below sea-level, and the surface is covered with sand and salt marshes. The character of the country compels the inhabitants to lead a nomadic life, and hence **cattle-rearing** is their chief occupation. The best known tribes are the **Kalmucks**, in the lower Volga valley, and the **Kirghiz**, between the Volga and the Ural. Horses and fat-tailed sheep are owned by these wandering tribes, while some of them use camels to carry their goods from the Caspian to Orenburg.

Astrakhan—the only important town—is at the mouth of the Volga. It trades in Astrakan fur and tallow (both obtained from sheep); **sturgeon**, caught in the Volga and Caspian, from which isinglass and caviare are obtained; while petroleum is brought from Baku and cotton from Central Asia, to be distributed from Astrakhan to the different parts of Russia.

(6) **Caucasia.** – From its configuration this region is divided into three parts:

(*a*) A plain, steppe-like in character, between the Manych depression and the rivers Kuban and Terek.

(*b*) The Caucasus mountains, of which the highest point is Mount Elbruz, consists of a main range and several minor parallel ranges.

(*c*) Trans-Caucasia, which includes the fertile valleys of the Rion and Kura.

The Caucasus mountains are difficult to cross, owing to the height of the passes and the scarcity of transverse valleys. There are two routes from north to south; one by the Caspian gate along the low-lying shore of the Caspian Sea, the other by a military road over the **Dariel Pass**, near Mount Kazbec, which leads directly from Vladikavkaz (the ruler of the Caucasus) to Tiflis. From the rivers Kuban and Terek, forests of deciduous trees extend southwards to a height of 5,000 feet; above this, coniferous trees predominate up to 7,000 feet; then grasses only are met with up to the snow line.

In **Trans-Caucasia** there is no real winter, and the rivers do not freeze; in the west, near the Black Sea, rain falls at all times of the year, while in the eastern parts of the region droughts are frequent, and artificial irrigation is necessary. In the valleys of the Rion and Kura, wheat, maize, barley, and even rice are grown. The vine is cultivated throughout the region. On the southern frontier of Trans-Caucasia is **Mount Ararat**, where three empires, Russia, Turkey and Persia, meet. **Tiflis**, on the Kura, is a good centre for road and railway traffic. The most important production of Caucasia is **petroleum**. **Baku** is the chief town of the oil district. The oil is sent (*a*) to Astrakhan for

distribution along the Volga; (*b*) to Poti and Batum for distribution to Black Sea and Mediterranean ports.

EXERCISES.

1. What changes in vegetation would be met with in travelling from Tiflis due northwards to the Arctic Ocean? Account for these changes as clearly as you can.

2. Distinguish between coniferous and deciduous trees. Where do these trees grow in Russia? Of what use are they to the inhabitants of these districts?

3. Under what conditions do men live who are engaged in the following occupations in Russia: Wheat growing, cattle rearing, timber cutting and fur hunting?

LESSON XII.

RUSSIAN CEREALS.

1. On a map of Russia shade the wheat-growing areas. Mark clearly the routes by which the wheat is carried from the areas of cultivation, and the towns to which it is taken either for export or distribution.

2. The average annual production of cereals is given in the following table:

RUSSIAN CEREALS.

Cereals.	European Russia.	Siberia.
	1000 cwts.	1000 cwts.
Wheat, - - - - -	350,509	24,128
Rye, - - - - - -	426,723	11,973
Oats, - - - - - -	285,722	19,450
Barley, - - - - -	179,723	2,188

Exportation of cereals from European Russia :

	1000 cwts.
Wheat, - - - -	60,567
Rye, - - - - -	11,733
Oats, - - - - -	14,467
Barley, - - - -	57,011

(*a*) Draw a vertical column 10 inches high to represent the total production of wheat. Then draw columns proportionately high to represent rye, oats and barley respectively.

(*b*) What percentage of wheat produced in European Russia was exported? Find also the percentage for rye, oats and barley.

Cereals—such as wheat, rye, barley and oats—can be grown almost anywhere in European Russia except on the border lands. The variations of climate and soil tend, however, to localise the cultivation of each cereal; **rye** is grown on the poor soils of the Baltic provinces, wheat on the rich black earth, while barley is grown far north of St. Petersburg. One-third of the cultivated area of Russia is devoted to rye; this crop provides food for nearly the whole of the Russian peasantry. The most extensive areas which produce rye, oats and barley are Poland and the districts between latitude 55° and 65° N.

Wheat requires more favourable conditions than rye. It is grown extensively for export on the Black Earth Region. The Russian peasant relies on the fertility of the soil; he does not farm his land in a scientific way, but follows old-fashioned methods of cultivation, with the result he gets only 10 bushels of grain per acre, while in England 30 bushels are often obtained. The Russian farmer often lacks ready money to pay the tax collector, so he must either borrow or sell his grain at any price offered him by a speculator. He is too illiterate to study the state of the wheat market for himself. Even now, in some districts machinery is used hardly at all for cutting or threshing wheat.

Again, in the world's markets, Russian wheat fetches a lower price than American wheat, because it often contains impurities, and the quality cannot be relied on.

When the harvest is at an end, the transportation of the wheat presents many difficulties. The wheat must be taken to the nearest railway or waterway during the early autumn, as the country roads become impassable when the autumn rains begin. The general movement of the wheat for export is in one direction, viz. southwards to the Black Sea ports. This wheat causes serious congestion on the railways, while at the seaports there is a further loss of time due to the small number of grain elevators.

The rivers which cross the Black Earth region are the Volga, Dnieper, Don and Bug. The wheat shipped on the Volga goes up the river to **Rybinsk**, the great wheat market, from which it is distributed by water or rail to St. Petersburg and other towns. Most of this wheat is consumed in the north-west provinces of Russia, and very little is exported now from Baltic ports. On the Dnieper, Don and Bug, wheat is carried down the rivers to Black Sea ports. On the Dnieper, it is shipped to Kherson (the unnavigable rapids at Ekaterinoslav being passed by means of a canal).

Odessa, Nikolaiev and Rostov together ship two-thirds of all the wheat exported from Russia. **Odessa** faces the sea on a harbour which does not often freeze; it is a convenient depot for wheat brought down the Dniester, Bug and Dnieper; it is also the terminus of the South-Western Railway.

Nikolaiev is at the mouth of the Bug; the channel has been deepened to accommodate large steamers; ice-breakers are used to keep the harbour open in winter.

Rostov, on the Don, is an important collecting centre for grain from the south-east. There is no accommodation for large ships, hence small vessels take the grain to Taganrog, where it is transferred to sea-going vessels.

Novorossiisk, on the Black Sea, on a branch of the Caucasian railway, now competes with Rostov for grain grown in the

south-east. Its harbour is open even when the Don at Rostov is frozen.

The Black Sea is increasing in commercial importance every year, although it is lacking in good harbours. The Sea of Azov is very shallow, while the ports of the Crimea are distant from the mainland. **Sevastopol** is now used as a naval station, and has ceased to be a commercial port.

Siberian Wheat.—It is interesting to find that the construction of the Trans-Siberian Railway, and the development of wheat cultivation in Southern Siberia near the railway, made the grain merchants of Southern Russia afraid that Siberian wheat would injure their trade by flooding the markets at Black Sea ports. In order to protect their interests, the Russian Government decided that the full railway rates should be charged on Siberian wheat sent to Baltic or Black Sea ports. This made it impossible for Siberian wheat to compete with Russian wheat at these ports. An outlet, however, was provided at a reduced rate for Siberian wheat carried by rail from **Cheliabinsk** (on the Siberian frontier) via Perm, Viatka to Kotlass (on the Northern Dwina), and thence by river to Archangel. Recently, therefore, **Archangel** has become a wheat port.

EXERCISES.

1. What cereals are grown in Russia—(*a*) for exportation, (*b*) for home consumption? Where and under what conditions are the cereals grown?

2. What is meant by the lines on the map (p. 64) showing the northern limit of wine, wheat, and rye? Do these lines bound the present areas of cultivation?

3. How does wheat grown on the Black Earth district reach Odessa and Rybinsk respectively? Compare these towns as centres for the distribution of wheat.

LESSON XIII.

RUSSIAN INDUSTRIES AND TRADE.

1. On a map of Russia shade in the chief industrial areas; mark the chief centres of industry and the articles manufactured.

2. On the map of Russia measure the following railway distances:
(*a*) Moscow to Cheliabinsk;
(*b*) Moscow to St. Petersburg;
(*c*) Moscow to Odessa;
(*d*) Moscow to Warsaw.

3. Measure (*a*) the area of the Donetz coalfield (Fig. 20), (*b*) the Dombrovsky coalfield.

Industries and Trade.—Down to the middle of the nineteenth century Russian manufactures were unimportant, and, although an industrial development has taken place in this respect, Russia is at the present time far behind countries like Great Britain and Germany. In 1861, serfdom was abolished in Russia, and as a result of this most of the arable land became the property of the peasants, held, however, not by individuals, but by the village communities. Another result of the emancipation of the serfs was that members of families separated, and, as a consequence, more timber was required for building material, and more cleared land was required for cultivation. Forest trees therefore were cut down at a rapid rate until the Government undertook the control of the forests.

Many of the freed serfs migrated to the towns and engaged in various industries and trades; hence towns began to increase in size and importance. Most of the work, however, is still done in the houses of the industrial classes and not in factories.

Railways.—The construction of railways, which took place during the second half of the nineteenth century, also helped the industrial development. Russian railways were built in the

first place as military, rather than as commercial undertakings. From Moscow, the railways branch out in all directions to the



FIG. 19.—RUSSIAN RAILWAYS.

great centres of population. As the waterways of Russia are frozen during the winter months, and as distances to be travelled

are great, railway communication is of enormous commercial importance. Railways have rendered possible the development of the south Russian coalfield, while they are of the greatest use in the distribution of wheat and other products of the Black Earth region.

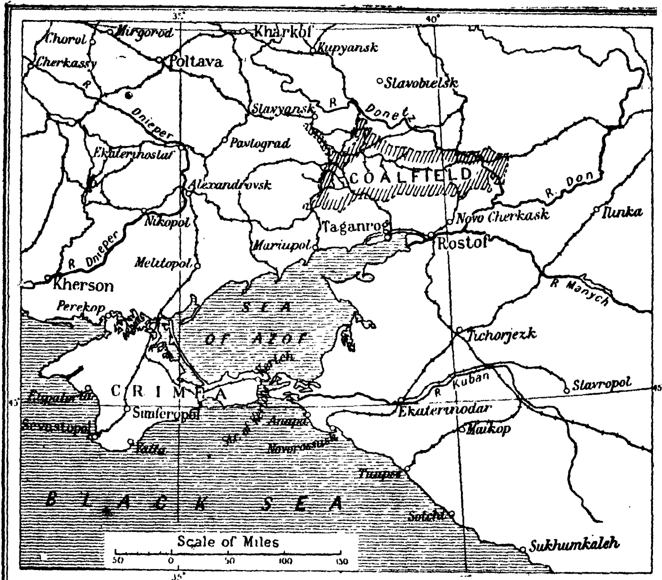


FIG. 20.—THE DONETZ COALFIELD.

There are two important **coalfields in Russia**:

(1) **The Donetz coalfield**, in southern Russia, about 9,000 square miles in extent.

This is the most productive coalfield in Russia, and it is noted not only for the quantity but also for the variety of the coal—anthracite, lignite and bituminous coal being mined. In this region there are no forests, hence coal is the only available fuel for the inhabitants and for the railways. The coal is also supplied to the ships at the ports on the Black Sea.

(2) **The Dombrovsky coalfield**, in south-west Poland.

The coal mined here is of excellent quality, and is used largely in factories, mills, houses and on the railways of Poland; while small quantities are carried as far as Moscow, Kichenev and Odessa. The production of coal, iron and

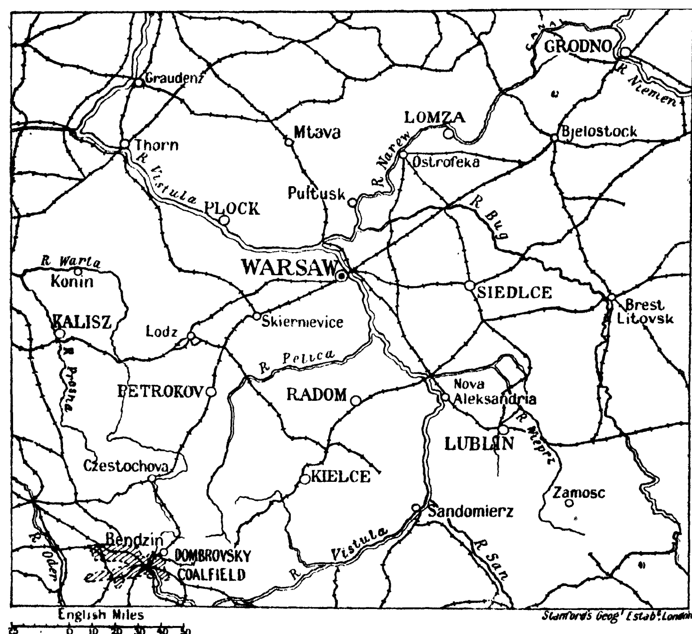


FIG. 21.—POLAND: RAILWAYS AND COALFIELD.

zinc has had an important influence on the development of its industries. **Lodz**, the chief town of the Petrokov district, manufactures cotton and woollen goods, while flour mills and leather works give employment to a large number of people. **Warsaw**, on the navigable Vistula, the capital of Poland, is not only the centre of the internal trade of the region, but it is at the intersection of the trade routes between Russia and

Western Europe. Its industries are machinery, leather dressing, linen weaving and metal work. Distilleries and sugar refineries are established in all the towns of Poland.

Moscow Industrial Region.—Moscow is the centre of the most important industrial region of Russia; it has good communi-

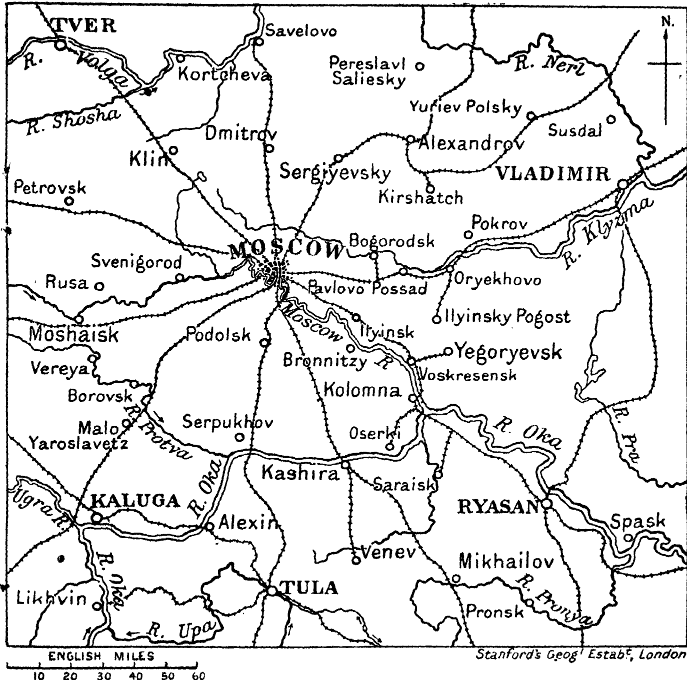


FIG. 22.—THE MOSCOW DISTRICT.

cation with all parts of Russia, both by water and by railway. Having forests to the north and a productive coalfield to the south (Donetz), Moscow is situated conveniently for receiving .w materials and for distributing manufactured articles. Machinery, leather and china-ware are manufactured at Moscow. At **Tula** there are iron and steel works, in which

rifles and swords are made. Cotton-spinning, wool and silk-weaving, are carried on at **Vladimir** and **Tver**, while rolling stock for railways is made at **Kolomna.** In this district there are a few coal mines, but the coal is of bad quality; it crumbles and will not coke, and is therefore useless for furnaces. The output of coal is diminishing.

Ural Industrial Region.—Coal is found on both sides of the Urals, but it is only worked on the western side; a considerable quantity is obtained every year between the Usva and the Yarva rivers. This region is noted for **mining** and for industries which depend on mining. Gold and platinum are obtained by washing the alluvial deposits at the foot of the mountains, while copper and iron ore are procured from mines sunk in the mountains themselves. Iron ore is smelted throughout the whole region; charcoal is used for fuel. At **Zlatoust** are steel foundries and ordnance works; at **Tagilsk**, boiler plates, agricultural implements and railway stock are manufactured. **Ekaterinburg** is noted for the Crown factory, where precious stones, obtained from the Urals, are cut; and it is the principal market of the region. At **Perm** are iron and steel foundries in which guns and armour plates are made, and in the neighbourhood salt is obtained by boiling down brine pumped from borings.

St. Petersburg Industrial Region.—Although there is no coalfield in the region, coal can be imported from Great Britain (the duty on imported coal at Baltic ports is only 3s. per ton, while at Black Sea ports it is four times as great, in order to protect the Donetz coalfield).

St. Petersburg manufactures tapestry, glass and china ware and machinery, while large numbers of people are engaged in cotton-spinning and weaving. At **Kolpino**, near St. Petersburg, all the parts necessary for a complete man-of-war are manufactured. At **Narva,** water-power is used in the cloth and linen mills. Flax-combing gives work to many people in the Pskov district.

Fairs.—From the earliest times merchants have exchanged their goods at annual fairs. Hundreds of fairs are still held in Russia, but they have declined in importance since the advent of railways. Railways tend to centralise the wholesale markets

at great commercial towns like Moscow, Warsaw, Odessa, etc., while the fairs tend to become markets for local products only. This is the case at Kharkov, where wool, hides, tallow, etc., are sold at the January fair. Fairs which still retain their old character are **Nijni-Novgorod** and **Irbit**. To the fair at Nijni-Novgorod, held from July to September, merchants travel great distances, bringing goods (tea, silk, camel's hair and drugs) from China, Siberia and Persia, to exchange for Russian products. Nijni-Novgorod is situated at the junction of the Volga and Oka, while along the lower Kama is the road into Siberia. Irbit is situated on the eastern side of the Urals, and its fair is second only to that of Nijni-Novgorod.

EXERCISES.

1.

IMPORTS AND EXPORTS.

Goods imported into U.K. from Russia.		Goods exported from U.K. to Russia.	
Article.	Value in £1000.	Article.	Value in £1000.
Timber, -	8,986	Coal, - - -	2,008
Flax, - -	1,777	Fish (Herring), - -	1,139
Cereals, -	13,183	Machinery, - -	2,637
Eggs, - -	2,932	Iron and Steel Goods,	734
Linseed, -	363	Woollen Yarn, - -	389
Petroleum, -	511	Cotton Yarn, - -	212
Poultry, -	373	Cotton Goods, - -	542
Hides, -	285		
Wool, -	169		

Comment (see p. 15) on the above table. Compare the imports and exports as regards kind of goods.

From what parts of Russia do we obtain the imported articles?

By what route would petroleum from Caucasia be brought to this country?

2. What are the chief means of transport in Russia? What are the chief difficulties in transport? Describe how goods may be carried from

(*a*) Astrakhan to St. Petersburg;
(*b*) Kherson to Riga;
(*c*) Warsaw to Cheliabinsk.

3. Examine Fig. 11. Describe the position of St. Petersburg with regard to the Gulf of Finland. What is the length of the Ship-Canal? Why was it made? How has it affected Kronstadt?

4. Compare Moscow and Warsaw as railway centres (see Figs. 21 and 22). Point out what towns would be reached by the railways shown on the map if they continued beyond the limits of the map.

LESSON XIV.

GERMANY—CLIMATE AND VEGETATION.

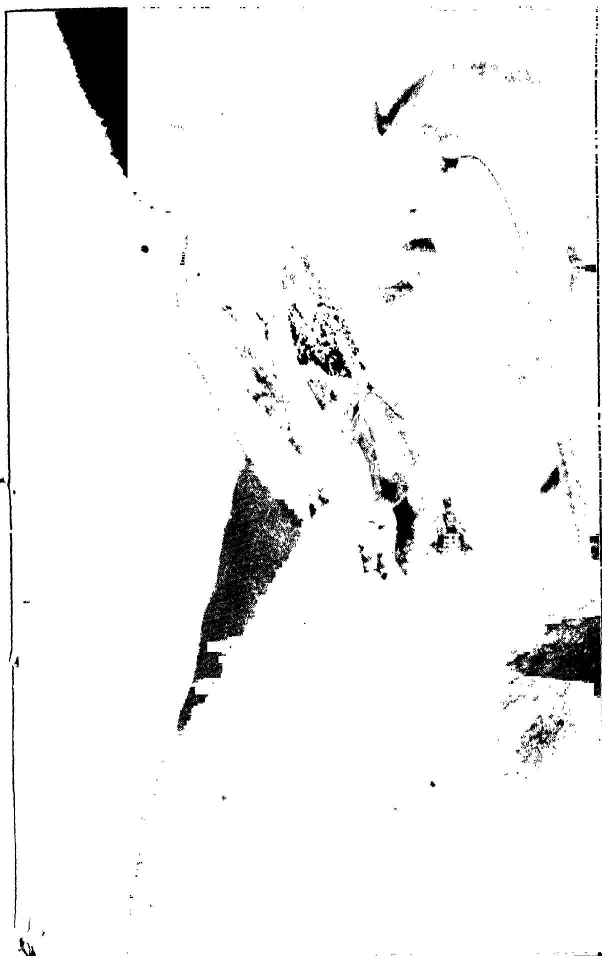
1. From the physical map of Germany find the height above sea-level of the following places: Berlin, Mannheim, Breslau, Munich and Dresden.

2. Find on the map the position of Berlin and Nice. Draw a diagram similar to Fig. 69; mark the temperature curve and vertical columns for the rainfall for each month. [illegible] diagram write the average temperature for the [illegible], and the total rainfall.

TEMPERATURE AND RAINFALL.

1910.	Berlin.		Nice.	
	Temperature.	Rainfall.	Temperature.	Rainfall.
		In inches.		In inches.
January,	29° F.	1·68	40° F.	1·26
February,	34	1·99	42	0·83
March,	36	0·44	45	2·09
April,	45	0·99	49	2·37
May,	53	2·29	56	0·71
June,	68	2·13	65	2·64
July,	65	2·82	67	1·03
August,	60	6·73	68	0·83
September,	50	1·28	60	1·96
October,	45	0·59	56	0·19
November,	36	2·70	46	3·38
December,	32	1·08	42	10·29

3. On a map of Germany trace the courses of the chief rivers; thicken the navigable parts of the rivers. Mark the



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Fig 23 —A Valley in the Black Forest

chief towns on the navigable waterways, and write the chief articles of trade connected with each town.

4. Draw a section along line 12° E., using a vertical scale of one-tenth of an inch for 600 feet, and a horizontal scale twice that of the map.

5. The areas under crops in Germany are as follows:

Crops.	Area.	Crops.	Area.
	1000 acres.		1000 acres.
Wheat, -	4,901	Hay, - -	14,903
Rye, - -	15,466	Vines, - -	281
Barley, -	3,926	Tobacco, -	39
Oats, - -	10,723	Hops, - -	69
Potatoes, -	8,240		

(*a*) Find the total area under cultivation, and make a percentage table for the various crops.

(*b*) On squared paper mark a square (side 10 inches). Shade in different colours the number of squares for each crop. Write the name of each crop on the proper colour.

6. On an outline map of Germany mark the districts in which the above crops are chiefly grown.

Germany may be divided into two natural regions: (i) a highland region in the south; (ii) an extensive plain in the north. South of latitude 51½° nearly all the land is over 600 feet in height, while north of that line very little land even reaches 600 feet. This division of the country into **Highlands** and **Lowlands** has had an important influence on the climate, the productions, as well as on the distribution and occupations of the people.

Climate.—The Baltic Sea is not large enough to exert a moderating influence on the climate of Northern Germany. The result is that, except on the North Sea coast-lands, **continental** conditions of climate prevail.

The westerly winds, on reaching the German coast, tend to raise the temperature in winter, and so the harbours of Ham-

burg and Bremen are usually free from ice, while in summer the westerly winds moderate the heat. The difference, therefore, between the January and July mean temperatures is not very great. Further east, the difference between the winter and summer temperatures becomes greater and greater, the rivers and harbours being frozen for considerable periods in the winter.

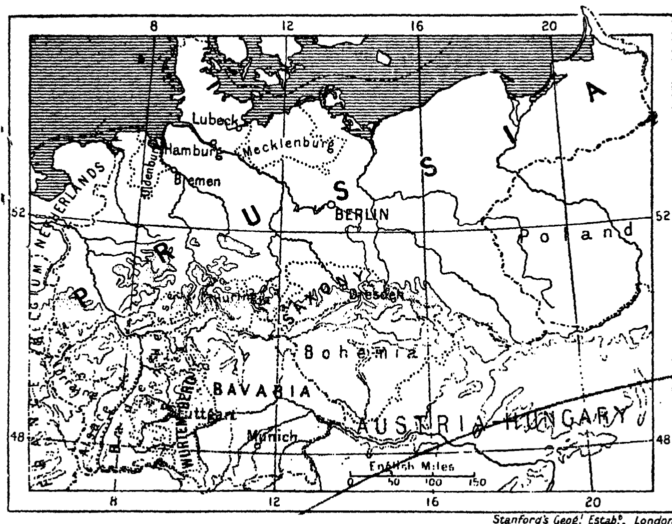


FIG. 24.—GERMANY: HIGHLANDS AND LOWLANDS.
The shaded areas are over 600 feet in height.

In Western Germany most rain falls in the autumn and winter; this is due to the cyclones which reach the country at that period of the year. Further east, however, autumn and winter rains give place to unbroken frost, and in the most easterly provinces rain falls in the summer. The Silesian plain has the smallest rainfall of any part of Germany.

In Southern Germany these conditions are modified by the elevation of the country. Elevation tends to reduce the temperature of a place below the sea-level temperature in the

same latitude ; hence the elevation of Southern Germany brings about extremes of temperature similar to those produced by change of position from west to east on the northern plain.

The Bavarian plateau is swept by cold winds in winter, and snow remains on the Riesengebirge for the greater part of the year. The warmest parts of Germany are the sheltered valleys of the Rhine (between the Vosges and Black Forest), the Main and Neckar; these valleys get less rain than the mountains which bound them. The Harz Mountains, which project northwards, and so intercept the south-west winds, are constantly enveloped in mists; the annual rainfall on the Brocken is 66 inches.

Vegetation.—About twenty-five per cent. of the surface of Germany is covered with **forests**, although vast areas have been cleared within historical times. Trees cover the mountains of Southern Germany, hence the word *wald* (forest) is applied to these forest-clad mountains, *e.g.* Schwarzwald (=black forest), Böhmer Wald (Bohemian forest).

Coniferous forests cover the largest area—larches and pines grow on the Alpine borderlands, silver firs in the Black Forest, Vosges and Thuringia, and spruce on the Sudetes and Harz Mountains.

Deciduous trees also flourish—oaks grow in the valleys of the Elbe and Oder, beeches on the Baltic borderlands and on the hills of the Weser district. In the north-west, trees do not grow well on account of the sandy nature of the soil and the winds which sweep across the country; the moors and heaths are covered with **grass** and shrubs.

EXERCISES.

1. (*a*) What important rivers of Germany have their sources beyond the frontier?

(*b*) What rivers rise in Germany and have to cross the frontier in order to reach the sea?

(*c*) Write a list of rivers to show that the drainage from Mount Fichtel reaches the Baltic, North Sea and Black Sea.

2. Compare the climate of Berlin with that of Munich, with reference to the statistics of temperature and rainfall, on pages 78 and 116.

LESSON XV.

RACES OF PEOPLE IN GERMANY.

1. The total population of the German Empire is nearly 65 million people.

The latest occupation census gives the following facts:

GERMANY—CHIEF OCCUPATIONS OF THE PEOPLE.

Occupation.	No. of People.	Occupation.	No. of People.
	1000.		1000.
Agriculture and Cattle Rearing, - -	9,732·5	Domestic and other service, - -	1,736
Forestry and Fishing,	151	Professions, - -	1,739
Mining and Metal Work, - - -	11,256	Without Profession or Occupation, -	3,405
Commerce and Trade,	3,478		

Make a table showing the percentage of people engaged in these occupations to the whole population of Germany.

On squared paper draw seven columns, each 10 inches long and ½ inch broad, and mark off the percentages already obtained.

2. The number of people who emigrated from Germany in 1906, 1908 and 1910 respectively is given below; and the countries to which they went:

EMIGRATION FROM GERMANY.

Year.	Great Britain.	United States.	Brazil.	Other American Countries.	Australia.	Total.
1906	310	29,226	182	1,237	86	31,074
1908	157	17,951	326	1,240	175	19,883
1910	77	22,773	353	2,184	128	25,531

The totals in the last column are in excess of the numbers in the various countries, as a few emigrants went to other countries than those in the table.

(*a*) Find the average number of people who emigrated in the three years 1906, 1908 and 1910.

(*b*) Make a percentage table of those who emigrated to the various countries in the table.

(*c*) On squared paper mark six columns, each 10 inches high and ½ inch broad.

In the first column mark the percentage of emigrants to Great Britain; mark the other columns in a similar way, and head the last column "emigrants to other countries."

3. *ow* and *au* are Slavonic endings for the names of towns; *itz* is a Slavonic ending for personal names and place-names.

On a map of Germany mark any names (*e.g.* Cracow, Libau, Görlitz) which have these endings, and then draw a line across the map so that all or nearly all of these names are on *one* side of the line.

4. *Burg* means a town (cf. borough, burgh); *berg*, a fortified place, usually on a hill; *wald* means forest.

On the same map which was used for the Slavonic names mark in red ink any names ending in burg, berg or wald. Note the positions of these with regard to the line you have drawn.

Write on the map any inference you can draw with regard to the distribution of races in Germany.

The People of Germany.—Many different races of people live in Germany; the dominating race is of Teutonic origin. The **Teutons** who settled in the Highlands of Southern Germany (sometimes called High Germans) mixed with the **Celts** who lived there, and their descendants are at the present day noted for their dark eyes and their dark skins. The Teutons who settled on the northern plain (called Low Germans) are distinguished by their blue eyes and fair complexions.

From the fifth century onwards the Teutons carried on a continuous struggle with the **Slavs**, who had established themselves on the Baltic plain as far west as the Elbe. By the twelfth century many of the Slav tribes had not only been subdued, but they had been gradually absorbed by their conquerors.

In some parts of the country, however, the Slavs retained their nationality, and these are known as **Chekhs** in Silesia, **Wends** in the Spree Valley, **Poles** in Posen and south-east

Silesia and **Lithuanians** in the north-east part of Prussia. The Wends and Lithuanians still speak Slavonic dialects; they are, however, so surrounded by German-speaking people, and they are brought more and more into contact with others since the introduction of railways, that in all likelihood they will be Teutonised in course of time.

In addition to men of Slavonic origin there are other non-German peoples, such as **Danes** in Schleswig-Holstein, **French** in Alsace-Lorraine and **Jews** in many of the large towns.

On looking at a political map of Germany, it will be noticed that the country is divided into many states. For many centuries each state had its own ruler, and as far as possible maintained its own independence; confederacies of states were formed, but they had little cohesion. From the fifteenth century onwards the **Mark** of **Brandenburg** (from which the modern kingdom of Prussia grew) became more and more powerful, until it dominated the other states. The **union of the German states** under an Imperial ruler took place in 1871, at the close of the Franco-German War. The present German empire consists of a confederation of twenty-six states, each having its own form of government, but Imperial affairs are administered by the Central Government.

Since the union of states into an empire, with a strong administrative government, many important results have followed. Germany has become one of the Great Powers of Europe; she has developed a **colonial policy**; she has made great **industrial progress** by developing her mineral resources, and by extending her manufactures and commerce, and her wealth and population have increased enormously during the same period. The rapid growth of industries in particular places, such as on the coalfields, has caused a shifting of the population from the country to the towns. The changed conditions have also led to **emigration**; most German emigrants leave Bremen, Hamburg, or Antwerp in order to settle in the United States or in British colonies.

EXERCISES.

1. Forty-one towns in Germany have more than 100,000 inhabitants. The largest towns are given in the following table :

CHIEF TOWNS OF GERMANY.

Town.	Population.	Town.	Population.
	1000.		1000.
Berlin, - - -	2,071	Nuremberg, - -	333
Hamburg, - -	932	Charlottenburg, -	305
Munich, - -	595	Dusseldorf, - -	358
Dresden, - -	547	Hanover, - -	302
Leipzig, - -	588	Stuttgart, - -	286
Breslau, - -	512	Chemnitz, - -	287
Cologne, - -	516	Magdeburg, - -	280
Frankfort on Main,	415	Essen, - - -	295

Describe the position of the towns in the above table, and mention any circumstances which have led to the growth of towns at these particular places.

2. Examine the map of Berlin (Fig. 14), and describe it. What waterways are shown on the map? Explain the endings of the names Grunewald, Charlottenburg, Schoneberg and Tiergarten.

3. For question on the fortresses on the Franco-German frontier, see p. 135.

4. On a political map of Europe, find the countries which adjoin Germany. Point out where the boundary of Germany is (*a*) natural, (*b*) artificial.

5. Since 1884, Germany has acquired many foreign possessions ; the chief are as follow : In Africa—Togo, Kamerun, German South-West Africa, German South-East Africa. In Asia—Kiau-chau. In the Pacific—Kaiser Wilhelm's Land (New Guinea), Bismarck Archipelago, Caroline Is., Pelew Is., Marianne Is. ; Solomon Is., Marshall Is., Samoa.

In tabular form write a list of these dependencies, the position of each, and the name of the nearest British possession. In what continent does Germany possess no territory?

LESSON XVI.

GERMAN COALFIELDS.

1. Draw an enlarged sketch-map of the Westphalian coalfield and district. Mark the chief industrial centres and the industries carried on at each. Measure roughly the area of the coalfield.

2. Every year about 137,535,000 tons of coal are raised in Germany.

GERMANY—PRODUCTION OF COAL.

Coalfield.	Production.	Coalfield.	Production.
	In 1000 tons.		In 1000 tons.
Dortmund, -	76,258	Alsace-Lorraine,	2,114
Breslau, - -	36,184	Bavaria, - -	1,443
Bonn, - -	15,372	Other Districts, -	989
Saxony, - -	5,175		

Taking 360 to represent the total production of coal, find the proportion which was raised on each coalfield. Draw a circle radius two inches; divide it into sectors to represent the coal production of the various districts. (Fig. 10.)

3. Every year Germany exports on an average 19,740,000 tons of coal.

GERMANY—EXPORTATION OF COAL.

Country to which Coal was Exported.	1000 tons.	Country to which Coal was Exported.	1000 tons.
Austria Hungary, -	7,558	Russia, - - -	907
Netherlands, - -	4,507	Italy, - - -	171
Belgium, - -	2,991	Denmark, - -	42
France, - - -	1,554	Other Countries, -	619
Switzerland, - -	1,391		

On a map of Germany mark the coalfields given above; mark the routes by which coal would probably be carried to the countries in the table. Mark the names of the countries on the

map, and distinguish those that have coalfields from those that have none.

4. Some of the chief articles of trade between Germany and the United Kingdom are given below.

IMPORTS AND EXPORTS.

Articles imported into the United Kingdom from Germany.	Value. £1000.	Articles exported from the United Kingdom to Germany.	Value. £1000.
Sugar, - - -	8,845	Cotton Goods, - -	2,917
Glass, - - -	918	Cotton Yarn, - -	3,542
Eggs, - - - -	296	Woollen Goods, -	1,833
Cotton Goods (Lace, Hosiery, etc.), -	5,072	Alpaca, Mohair, etc.,	1,542
Woollen Goods, - -	2,170	Raw Wool, - -	1,819
Iron and Steel Goods,	3,632	Iron and Steel Goods,	1,606
Machinery, - - -	1,278	Herrings, - - -	1,903
Cotton Yarn, - -	179	Machinery, - -	1,903
Wood and Timber, -	684	Coal, Coke, etc. -	4,767

(*a*) Write out the above table so that the articles which appear in both columns are opposite each other,

(*b*) Write the difference in import and export value of these articles.

Note that England and Germany are both manufacturing countries, but the processes of manufacture are not necessarily the same.

Coalfields.—In Germany, as in our own country, the production of coal has had an important influence on the development of industries. Goods are manufactured most conveniently on or near coalfields; German manufactures are not localised to the same extent as in the British Isles. The most productive coalfields in Germany are worked in Westphalia, Silesia and Saxony. There are, also, less productive coalfields in Bavaria, Alsace-Lorraine and other districts.

The Westphalian Coalfield.—About 60 per cent. of Germany's coal supply is obtained from this coalfield. The chief mines are worked in the Ruhr valley, and **Dortmund** is the centre of a mining district in which 335,000 miners are employed.

Some of the coal is consumed in the factories of Westphalia and the Rhenish Province, and some is sent away by river, canal or rail. **Duisburg-Ruhrort** is the largest inland harbour on the continent both as regards size and trade, and one-third of the coal loaded at this harbour goes down the Rhine past the Dutch frontier, while the rest goes up the Rhine for distribution.

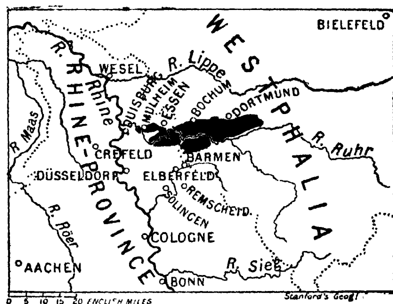


FIG. 25.—THE WESTPHALIAN COALFIELD.

Iron ore is found in the **Westphalian Coalfield** as well as in districts near at hand, such as **Lorraine** (Diedenhofen) and **Luxemburg.** The amount required for the iron and steel industries is so great that ore from Sweden is imported via the Netherlands; some of it, however, is carried to the coalfield on the Dortmund-Ems canal in order to save expense. At **Essen** are Krupp's great iron and steel works, in which cannon, armour-plates and machinery are made. **Remscheid** and **Solingen** are noted for cutlery and machinery; **Bochum, Mulheim** and **Oberhausen** for blast-furnaces.

Textiles in great variety are manufactured in Westphalia and the Rhine Province. **Raw wool** is produced on the uplands of the district, and it is also imported in large quantities from South America. **Barmen** and **Aachen** are the chief centres of the industry—the latter town specialising in **broadcloths** and **blankets. Linen** is made largely from Belgian flax at **Bielefeld.** Raw cotton is obtained from the United States, and is manufactured at **Elberfeld, Dusseldorf, Cologne.** As in England, the **cotton** manufacture is carried on chiefly in the western districts, where the rainfall is heavy. Cheap cotton goods are exported to all parts of the world, the South American States being the chief buyers. **Silk** goods have been made at **Crefeld** for many centuries, as the river water is said to be very suitable for dyeing purposes.

Many other manufactures are carried on on this coalfield; **paper** is made from rags and wood pulp; **glass** bottles are made at Dusseldorf and **chemicals** at Elberfeld.

The **Saxony coalfield** is much smaller and less productive than that of Westphalia. **Zwickau,** in the Mulde valley, is the centre of the mining industry, and **Freiberg** is famous for its school of mines. Iron ore is obtained from the Erzgebirge (ore mountains), as well as from Alsace-Lorraine and Sweden, and it is smelted on the coalfield. Locomotives and other kinds of machinery and metal-plated ware are made at **Chemnitz.** Saxony is the busiest manufacturing district of Germany, and it supports a denser population than any other part of the country. The industrial region extends far beyond the limits of the coal-field, reaching even to the heights of the Erzgebirge. The presence of a large population on these mountains was due in the first place to tin and silver mining, which attracted many people in the sixteenth century. With the decline of the mining industry many of the inhabitants took to other occupations, such as weaving. This occupation grew in importance owing to the introduction of merino sheep into the district in the eighteenth century, by which the quality of the wool was greatly improved.

Chemnitz, the centre of the textile industry, specialises in **hosiery** and **shawls**; the bulk of the hosiery is, however, made by small manufacturers in the surrounding country. Machines are supplied on easy terms to the village workman, and in a small workshop the man and his family work together at some particular branch of the industry. In one shop will be found frames for **lace hose,** in another for **plain hose** and in a third for **striped hose.** The finished articles are collected and sent to the big distributing firms at Chemnitz.

Cotton spinning is carried on at Zwickau and Chemnitz, while Plauen is noted for laces and **embroideries,** made either by hand or by machinery.

Many other articles are manufactured on this coalfield, such as **boots and shoes, gloves, toys, glass** and **paper.**

Dresden, the capital of the kingdom of Saxony, is situated on the navigable Elbe; it is noted for its art-galleries, museums,

and libraries. Dresden china is made chiefly at **Meissen**, a few miles further down the valley.

Leipzig, on the plain just north of the highland region, is conveniently placed for inland trade. Its fairs, which date back to the twelfth century, are still largely attended by merchants, furs and leather being important articles. Leipzig has great printing works for cheap books and cheap music; pianos and other musical instruments are also manufactured.

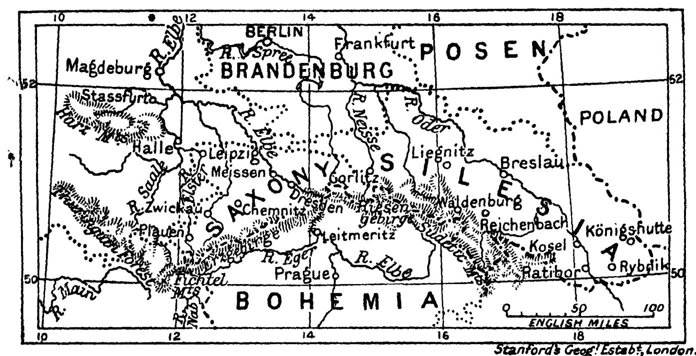


FIG. 26.—THE INDUSTRIAL AREAS: SAXONY AND SILESIA.

Rock salt is obtained in Prussian Saxony in the district round **Halle**; the largest salt works are at **Schönebeck**. **Stassfurt** is noted for its numerous chemical factories; in these factories chemicals are prepared for use in the textile industries, and chemical manures for use in agriculture.

Silesia is very rich in minerals, **coal**, **iron**, **zinc** and **lead** being found in large quantities. Coal is mined in two districts (*a*) in the neighbourhood of **Waldenburg**, in Lower Silesia, (*b*) in Upper Silesia; the most easily worked mines are at **Rybnik** and **Kattowitz**. The upper Silesian coalfield extends beyond the frontier into Russian Poland and into Austria.

Iron ore is obtained from the district lying south of the Oder between **Oppeln** and **Liegnitz**; it is used for the manufacture of machinery at Breslau. The zinc from **Konigshütte**, in Upper

Silesia, together with that from the Aachen district, gives Prussia the first place in Europe for zinc production.

Like Saxony, Silesia has long been famous for its **fine wool.** The number of sheep kept in this and other German states has been steadily decreasing owing to the low prices now paid for wool. Land that was once used for grazing sheep is now used for growing cereals. Foreign wool can be obtained very cheaply from the Argentine, Australia and other countries, and so more and more imported wool is being woven in German mills. Woollen goods are manufactured in large quantities at Liegnitz, Görlitz and Breslau. **Flax** is grown in Silesia, but the production does not meet the requirements of the **linen mills** of Gorlitz and Reichenbach; the deficiency is made up with Russian flax.

Breslau, the capital of Silesia, is one of the great manufacturing centres of Germany. It has an important wool mart, and it is well situated for commerce and for industries.

EXERCISES.

1. Examine Fig. 26, and compare Saxony and Silesia as regards mineral productions and manufactures. Why are the goods manufactured in these regions carried northwards rather than southwards?

2. Comment on the Import and Export table (page 88), (*a*) with regard to those articles which appear on both lists, (*b*) on those articles which appear on one list only.

3. On an average Germany imports 11,009 thousand tons of coal every year; of this quantity 9,274 thousand tons are obtained from the United Kingdom.

From the statistics of the production and exportation of coal (p. 87), find (1) how much coal is consumed in Germany every year; (2) the percentage of coal imported into Germany which is of British origin.

Why does Germany both import and export coal?

4. In what districts of Germany are textiles manufactured? Explain why the industry is carried on in each particular district.



FIG 27 —THE LORELEI ROCK
On the right bank of the Rhine, a few miles below Bingen

LESSON XVII.

THE RHINE.

1. Draw a large map of the Rhine from Basle to Coblenz, and mark the tributaries which enter the Rhine on this part of its course. Thicken the rivers that are navigable, and insert the names of towns mentioned in the description.

Shade the land above 600 feet. Mark the areas for forests, wine growing and wheat growing.

2. Measure the length of the rivers Ill, Moselle, Neckar and Main. Write in tabular form (*a*) the names of the rivers in order; (*b*) position of the source; (*c*) length; (*d*) two towns on each river.

3. Examine Figs. 27 and 29, and in each case find the direction in which the Rhine is flowing.

The Rhine is the most important river of Germany; it provides the only natural waterway between southern and northern Germany, and since 1869 it has been free to the ships of all nations.

It will be seen from a map that the source of the Rhine is in Switzerland, the middle course in Germany and the delta in the Netherlands. From Lake Constance to Basle the river forms the boundary between Switzerland and Germany; at Basle the Rhine turns northward and flows through a valley bounded on the east by the Schwarzwald (or Black Forest) and on the west by the Vosges. These mountains are very similar in geological structure; the valley between them has been formed by *fractures* in the rocks, followed by a sinking of the land; in this way a *rift valley*, twenty miles wide, has been formed.

Between Basle and Mayence the Rhine now flows in a carefully-kept channel, so that it is **navigable** for small river boats. Basle has grown in importance owing to its position with regard to the Rhine valley and the Burgundy gate. Most of the soil in this part of the valley is alluvial and, being sheltered by the surrounding highlands, it is very fertile; crops of **wheat, barley,**

maize and **tobacco** are grown, and cattle are pastured on the meadow-lands near the river. **Timber** is cut on the highlands and dragged down to the river; there rafts are formed and are floated down the stream; the men in charge of the rafts live upon them until the rafts reach Dordrecht or some other town, where they are broken up and the timber sold.

Between Basle and Mannheim there are no important towns on the river; Spires and Worms are very old cities, but they have decayed. **Mannheim**, a modern city, has made rapid progress in recent years. It has become a centre of the inland water traffic of Southern Germany. Grain and petroleum from foreign countries, as well as coal from Westphalia, are brought to this town for distribution. **Mayence** (Mainz) is also an important town for river trade and for transit trade by railway.

West of the Rhine is **Alsace**, one of the provinces taken by Germany from France in 1870. **Strassburg**, on the Ill, occupies a strategic position with regard to the Burgundy Gate and the Pass of Saverne (Zahern); along these natural routes French engineers constructed canals, one of which connects Strassburg with the Doubs valley, the other with the Marne valley. South of Strassburg is a manufacturing region, in which **Mulhausen** and **Colmar** are centres of the textile industry, especially cotton; the development of spinning and weaving in this district was in the first place due to the presence of water-power. Here, as in Saxony, the work is still partly carried on under the domestic system.

East of the Rhine is the duchy of **Baden**, of which **Carlsruhe**, situated in a barren, sandy woodland, is the capital. Baden (= bath), noted for its mineral springs, gives its name to the duchy. **Heidelberg**, an old university town, has a picturesque position on the Neckar, where the valley begins to broaden out towards the Rhine.

Stuttgart, the capital of the kingdom of Wurtemburg, has few natural advantages, but the energy of its inhabitants has made it a prosperous city; it is now one of the chief centres of the book trade in Germany. Below Stuttgart is **Heilbronn**, the highest point on the Neckar to which river steamers ascend.

In many of the villages of the Black Forest the inhabitants are not only engaged in timber-cutting, but they manufacture articles made wholly, or partly, from wood, such as toys, brushes and clocks. **Freiburg** is situated amid vineyards in a valley through which a mountain stream flows to join the Rhine.

Gorge of the Rhine.—Below Mayence, the Rhine is turned to the west by the Taunus, and the valley narrows until it becomes a gorge through which the river flows more swiftly and with increased depth. This is the most romantic part of the Rhine valley, and from the earliest times has been famous in legend and song. In some places steep cliffs rise from the water and fantastic crags overhang it; the hill-sides are often covered with trees, and ruined castles either crown some projecting rock or peep out of the woodland. Many of the slopes, especially those which face the south, are planted with vines; some of the vines are planted on terraces cut on the sides of the hill, and from a distance these terraces look like a series of scratches.

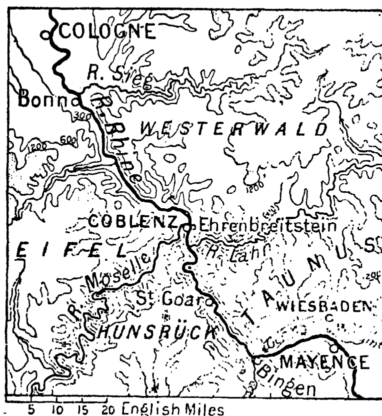


Fig. 28.—The Rhine Gorge.

Near Bingen is one of the narrowest parts of the gorge, where the **Lorelei rock** (Fig. 27) projects out into the river; on this rock, according to the legends, the Rhine maidens used to sit and sing, and so lure boatmen to destruction. Lower down, the great monument, representing **Germania**, stands on the Wederwald; this was erected to commemorate the Union of Germany in 1871.

At **Coblence** or **Coblenz** (from *confluentes*) the slow-flowing



The Photochrom Co.

FIG. 29.—STOLZENFELS CASTLE.

On the left bank of the Rhine, just above Coblence; on the opposite side of the Rhine, the Lahn joins the main stre m

Moselle joins the swift-flowing Rhine; for some distance below the junction the clear blue water of the Moselle can be distinguished from the muddy water of the Rhine (cf. the Saône and Rhone at Lyons). At Coblence the Rhine is crossed by a bridge of boats; on the heights facing Coblence is the great fortress of **Ehrenbreitstein**, once considered to be impregnable—it is now used as a store and as a garrison.

Below Coblence the valley narrows once more, and as **Bonn** is approached, a ridge called the Drachenfels (Dragon mountains) appears on the right. Beyond this the Rhine enters the plain, the country becomes flat, and the landscape is monotonous and uninteresting. **Cologne** (Ger. Köln), a corruption of the Latin *colonia*, dates back to the time of the Romans; it is noted for its magnificent cathedral, its manufactures, and its position for river and railway traffic.

Passing through the industrial region of Dusseldorf (see Fig. 25), the Rhine crosses the German frontier and enters the Netherlands, where it divides and forms a large delta.

The **Moselle** valley, like the Rhine, is noted for the cultivation of the vine. The most important towns in the valley are **Treves**, an old world city, and **Metz**, a strongly fortified position. The Moselle is of little use for navigation because of its tortuous course, but some traffic is carried on as far as Pont-à-Moussan in France.

The **Main**, the largest affluent of the Rhine, and navigable as far as Bamberg, crosses Northern Bavaria in a series of great bends; it flows through a beautiful country, the hill slopes being covered with vineyards or forests.

Frankfort-on-the-Main is an old commercial city; in the Middle Ages it became noted for its money market, its banking houses and its spring and autumn fairs. Frankfort has now become a manufacturing centre, while its trade has grown with the development of railways.

EXERCISES.

1. From Fig. 28 describe the courses of the Moselle, Lahn, and Sieg, as far as they are shown on the map.

2. Examine Fig. 28, and say what would be seen at the following points along the Rhine : Bingen, St. Goar, Coblence and Cologne.

3. Give the position and importance of the following canals :

(*a*) Rhine and Rhone ;
(*b*) Rhine and Marne ;
(*c*) Ems and Dortmund ;
(*d*) Ludwig.

LESSON XVIII.

NORTH SEA PORTS OF GERMANY.

1. Draw a sketch of Fig. 30, using a scale half as large again as that of the map. Mark with a red line (as far as the limits of the map), the course which an Atlantic liner would take when leaving Hamburg.

Measure the distance from Hamburg to Bremen (*a*) by a steamship route, (*b*) by a railway route. Mark the routes and distances on the map.

2. On a map of Europe measure the distance, as the crow flies, from Hamburg to the following places : London, Hull, Aberdeen, Essen, Munich, Dresden, Berlin, Warsaw, Memel and Copenhagen.

Where the direct line from Hamburg passes partly across land and partly across water, note the distance of each part.

On a sheet of paper mark Hamburg near the centre, and from it draw pencil lines to represent the distance and direction of the towns, using a scale of one inch for 50 miles. Line in the diagram, showing the land distances with continuous lines, the sea distances with broken lines.

The North Sea coast of Germany consists of low-lying stretches of sand, swept by winds and torn by the fierce waves of the sea. The coast is fringed with islands, and sand-banks

make the navigation of the channels extremely dangerous. **Heligoland** is an island less than one square mile in area, and is thirty-six miles from the mouth of the Elbe; the inhabitants get their living by fishing; thousands of visitors stay on the island every summer in order to enjoy the sea-bathing. Heligoland is now strongly fortified.

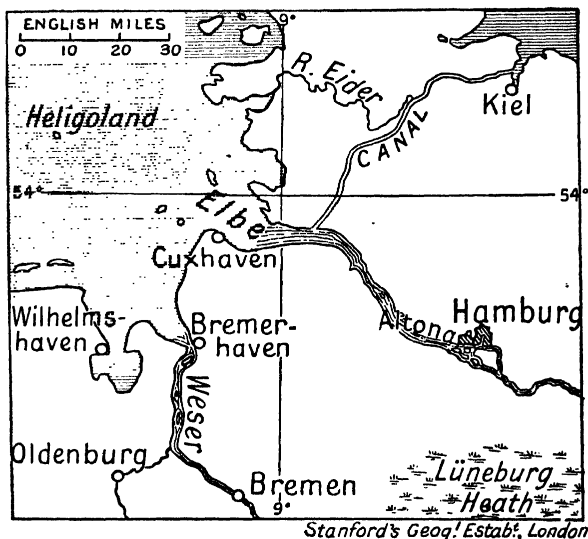


FIG. 30.—THE ESTUARIES OF THE ELBE AND WESER.

The estuaries of the Elbe and Weser are the only harbours which have direct access to the ocean, hence they control most of Germany's sea-going trade. Sand and mud-banks obstruct these estuaries, so that continuous dredging is necessary to maintain navigable channels. For 60 miles from its mouth low marshes stretch along both banks of the Elbe, and dikes protect the land from being flooded.

Hamburg stands on the Elbe, where in early times the river could be easily crossed. Although the small ships of those

days could reach the town, it was unable to outstrip the trade of its rival, Lubeck, which commanded the Baltic trade. The discovery of America, and the maritime activity which followed, gave Hamburg an advantage over all other German ports, except Bremen. During the seventeenth and eighteenth centuries Hamburg's trade with North America, Brazil and the United Kingdom rapidly developed. The greatest advance in commercial prosperity has, however, taken place within the last forty years; this has been due largely to

(*a*) the industrial development which followed the Union of the German States in 1871; manufactured goods are exported, and raw materials are imported through Hamburg;

(*b*) the establishment of German colonies;

(*c*) the opening up of new markets through the enterprise and business capacity of German merchants.

As the result of this increase of trade, extensive docks and quays have been constructed to accommodate the largest ships. A network of waterways and railways gives Hamburg communication with the interior. The Elbe itself is navigable beyond the German frontier, while canals connect the Elbe with the other rivers of Northern Germany.

Not only has Hamburg greatly increased its shipping, but it has also developed a vast manufacturing industry; raw materials, brought to this port are, in many cases, dealt with in mills and factories before being distributed; thus, wheat is ground into flour, coffee is roasted and ground, and palm oil is made into soap. These industries give employment to large numbers of people; the population has spread beyond the city boundaries in all directions. Hamburg and Altona together have a population of over 1,000,000. **Cuxhaven**, at the mouth of the Elbe, is an outpost of Hamburg; it has recently become an important fish market.

Bremen, the second seaport of Germany, is on the Weser. With the increase in the size of steamers it was found impossible to provide a waterway deep enough for ocean liners to reach Bremen. **Bremerhaven** was therefore established, 35 miles

below Bremen, and ample accommodation has been provided for the largest ships. Bremen is noted for the great tonnage of its ships; in this it even excels Hamburg. Among continental ports Bremen takes the first place in importing tobacco, rice, and cotton; tobacco factories extend into the villages beyond Bremen.

Both Hamburg and Bremen are free ports; the state and free city of Hamburg has an area of 160 square miles, of Bremen 99 square miles, governed in each case by a constitution of its own.

Wilhelmshaven, on Jade Bay, is a naval station. **Emden**, on the Ems, has lost much of its importance, but the canal connecting the Ems with Dortmund will help to revive its prosperity.

German Steamship Companies. The two most important companies are (*a*) the Hamburg American Line, (*b*) the North German Lloyd (Bremen).

The Hamburg American Line.

(*a*) The company's North American service consists of eleven different lines, which start from Hamburg, Stettin, and Genoa; the ships go to New York, Boston, Philadelphia, New Orleans and Montreal. The largest and fastest vessels run to New York.

(*b*) The West Indian-Cuba-Mexico service starts from Hamburg or from New York; it provides communication to the most important ports of the Antilles.

(*c*) Service from Hamburg and Antwerp to the Argentine and Pacific ports of America—also from New York to Brazilian ports.

(*d*) Far Eastern service via Suez Canal—Hamburg to Calcutta and Persian Gulf ports. East Asiatic service to Shanghai and Tientsin.

(*e*) With other companies it provides a joint service to South Africa.

GERMAN STEAMSHIP COMPANIES.

Hamburg.	Registered Tonnage.	Bremen.	Registered Tonnage.
	1000 tons.		1000 tons.
Hamburg American Line,	873	North German Lloyd Co.,	750
Hamburg Sth. American Line,	188	Hausa Line,	256
German Kosmos Line,	183	Argo Line,	46
German Australian Line,	144	Neptun Line,	45
German American Petroleum Co.,	84		
German East African Line,	68		
German Levant Line,	62		

EXERCISES.

1. Every year Hamburg imports from the United Kingdom goods of the value of £28 million, and exports to the United Kingdom goods of the value of £25 million.

The most important articles are given below:

BRITISH TRADE WITH HAMBURG.

Goods Imported into Hamburg from the United Kingdom.		Goods Exported from Hamburg to the United Kingdom.	
Articles.	Value. £1000.	Articles.	Value. £1000.
Coals,	3,341	Sugar (Raw and Refined),	9,052
Chemicals,	1,897	Eggs,	705
Tinned Sheet Iron,	541	Chemicals,	898
Sheep's Wool,	1,845	Hosiery,	571
Cotton Yarn,	2,514	Glass,	501
Woollen Yarn,	3,449	Machines,	620
Cotton Tissues,	2,268		
Machines (Sewing and other machines),	1,835		

Comment (see p. 15) on the above imports and exports, with special reference to coal, wool, cotton and sugar.

2. Every year Hamburg imports 4,608,000 tons of British coal and 2,507,000 tons of Westphalian coal. Find the total quantity imported, and the percentage of British and Westphalian coal respectively.

From what British coalfields does Hamburg obtain coal? By what routes does the Westphalian coal reach Hamburg?

3. About 17,000 sea-going ships, including coasting vessels, enter the Port of Hamburg every year (11,000 steamers and 6,000 sailing ships); about 5,200 enter the Port of Bremen (3,000 steamers and 2,200 sailing ships).

These ships belonged to the following countries:

Nationality.	Hamburg.		Bremen.	
	No. of Vessels.	Tonnage.	No. of Vessels.	Tonnage.
		1000 tons.		1000 tons.
British,	3,840	4,070	518	882
German,	10,267	6,657	4,026	2,710
Norwegian,	589	409	144	106
Dutch,	903	267	297	51
Danish,	645	228	30	21
Swedish,	375	144	112	32
French,	147	123	12	12
Russian,	80	51	7	2
Belgian,	37	33	1	·5
Spanish,	59	65	5	12
Other Countries,	58	—	50	—

Say what information can be obtained from the above table as to the shipping at Hamburg and Bremen respectively.

Can you account for the preponderance of British and German ships at these ports? Hamburg and Bremen both trade with the United States, and yet no ships flying the American flag enter these ports. How is this?

LESSON XIX.

THE NETHERLANDS.

1. (*a*) On the map of the Netherlands measure the area of land below sea-level.



FIG. 31.—A DUTCH SCENE.

(*b*) If the Frisian Islands became the coast-line how much land would the Netherlands gain?

(*c*) If the land below sea-level was no longer protected by dikes, mark on a map the coast-line which would take the place of the present one.

2. On a map of Belgium and the Netherlands mark the races of people and the language spoken by each race.

3. The chief articles imported into the United Kingdom from the Netherlands and Belgium are given below:

BRITISH IMPORTS.

Netherlands.		Belgium.	
Articles.	Value. £1000.	Articles.	Value. £1000.
Butter,	957	Motor Cars, Motor Cycles,	464
Cheese,	630	Flax,	1,180
Cocoa (prepared),	370	Glass—Window,	520
Eggs,	220	,, Plate,	360
Margarine,	2,281	,, Flint,	334
Bacon,	312	Leather Gloves,	320
Mutton (Fresh and Chilled),	477	Linen Yarn,	563
Pork (Fresh and Salted),	906	Linen Goods,	404
Condensed Milk,	763	Steel (Manufactured),	1,934
Paper for Printing, Packing and Millboard,	929	Zinc (Crude),	1,000
Plants, Shrubs, Bulbs,	368	Sugar (Refined),	578
Sugar (Refined),	1,677	Sugar (Unrefined),	238
Sugar (Unrefined),	281	Woollen and Worsted Yarn,	1,220

Re-write this table, grouping the articles in each column as follows: (*a*) Agricultural products, (*b*) dairy products, (*c*) manufactured articles, (*d*) other articles.

Find the value of the articles under these headings for the Netherlands and Belgium respectively.

Find the total value of the articles for the two countries respectively, then find the percentage of the whole value for each of the four groups. Represent the results diagramatically.

The Netherlands.—A large part of the Netherlands is formed by the alluvial deposits of the Rhine, Maas and Schelde. The Rhine has brought down enormous quantities of solid matter, the off-scourings of the Alps, with which it has built up a great delta. Much of this land is below sea-level, and **dikes**, 30 to 50 feet high, prevent the encroachments of the sea, while the banks of the rivers have been raised to keep the waters within their channels. Low-lying land thus protected by dikes is cleared of surplus water by pumping; the word **polder** is applied

to such land. Over this flat country winds blow without interruption, and so wind-power is utilised for pumping water from the polders into the rivers and canals. **Windmills,** with their slowly moving sails, are seen in all directions, and they are a

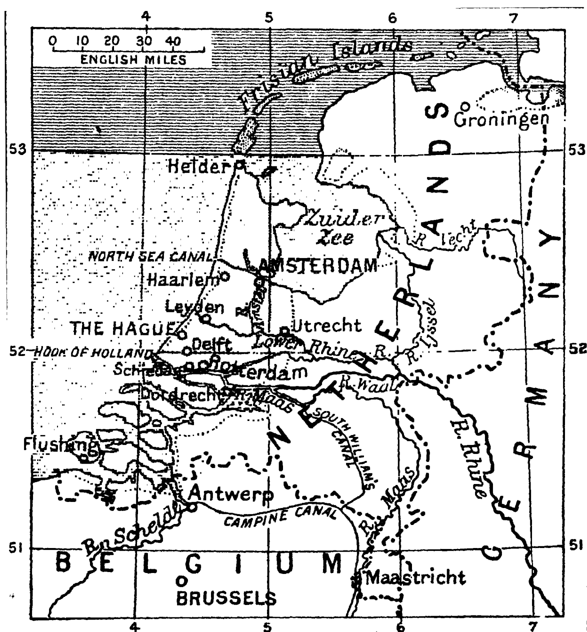


FIG. 32.—THE NETHERLANDS.
The shaded areas are below sea-level.

prominent feature of the landscape (Fig. 31). On the land thus reclaimed grass grows abundantly, and on it cattle and horses are pastured.

In the north-east of the Netherlands hills of gravel and sand rise 150-300 feet in height, and in the south-east the highest elevation is reached (above 1,000 feet). Wheat, rye, potatoes

and beet are grown largely in the eastern districts, and sheep are grazed on the sparse pasture lands of the south and north-east.

In the thirteenth century the North Sea burst over the land, and formed the **Zuider Zee**; the Frisian Islands mark the former coast-line. The Zuider Zee is too shallow for shipping, and is only used by a few fishermen. It is proposed to build a dam across the entrance and then to pump out the water, in order to reclaim a thousand square miles of land.

Fifty years ago a large part of the **Haarlem Lake** was drained, and on this land bulbs of all kinds are cultivated.

Productions and Industries.—Dairy-farming and agriculture are the most important occupations of the people; **butter** is made in large quantities, round **cheeses** are made at Edam, while **margarine** is made of animal fat and milk. Even where the land is under crops, cows are led by hand to feed on the grass which grows on the banks of the rivers and canals.

As there are no minerals in the Netherlands, manufactures are unimportant; textiles are, however, made in Overijsel and North Brabant; a fabric, called brown Holland, at Haarlem; and linen at Tilburg.

Many Dutch **industries** depend entirely on agricultural products, *e.g.* **spirit** (Holland gin), distilled from rye at Schiedam and Rotterdam; **tobacco** and **cigars** prepared at Amsterdam and Utrecht from leaves grown either in the Netherlands or in the East Indies.

As there are no large forests, timber is imported for the building of **wooden ships** at Rotterdam and Dordrecht.

Bricks and **tiles**, made from various clays, are used for building purposes, as stone does not exist. **Delft** has long been noted for glazed **earthenware**.

Many articles are imported into the Netherlands in order to undergo some process which will increase their value. **Diamonds** from South Africa are cut and set at Amsterdam. **Raw sugar** from Java is refined at Amsterdam; **tobacco** leaves from the East Indies are made into cigars; and **quinine** is prepared from cinchona bark.

Communication.—For internal traffic, **waterways** are more important than railways; goods are transported almost entirely by canals and rivers. Footpaths and, in many cases, roads, run by the side of the waterways.

Railways were laid down without difficulty across the flat lands, but many bridges had to be built over the canals and rivers. Dutch railways are used rather for international than for internal trade. **Flushing** and the **Hook of Holland** are railroad ports on the main routes between England and Germany.

Rotterdam receives goods from the Rhine valley for shipment abroad; raw materials, such as cotton from America, iron ore from Sweden and Spain, pass through Rotterdam to be manufactured on the Westphalian coalfield. **Amsterdam** is the commercial capital of the Netherlands, although **The Hague** is the political capital.

Dordrecht has river shipping trade in timber and wheat.

The Dutch people belong to three branches of the Teutonic race:

(*a*) **Frisians**, who live on the clay soils and low fens in the west and north-west; they possess a language and literature of their own;

(*b*) **Saxons** in the east and north-east;

(*c*) **Franks** in the south.

All these, however, form a united people, and they have a written language common to them all.

In the case of the Netherlands, **environment** has had a very marked influence on the character of the people. The incessant struggle which they had to carry on against the forces of nature, in order to save their country from the sea, developed in them dogged **perseverance** and **obstinacy**. They could never relax their efforts; the dikes had to be watched continually, for the sea had to be kept out at any cost. They thus became experts in canal-making and in draining marsh-land.

They showed the same indomitable spirit when resisting the Spaniards under Alva—preferring to open their dikes rather than submit.

The lack of resources at home made them take to the sea in

order to gain material wealth. They became bold **navigators**, and in the sixteenth century they acquired **colonies** in the East Indies (Java, Moluccas, Celebes, etc.), in the West Indies (Curaçao), and in South America (Guiana). The possessions of the Dutch are at the present time sixty times as large as the mother country.

EXERCISES.

1. Examine the table of articles (page 106) sent from the Netherlands and Belgium to the United Kingdom. Compare these countries as regards occupations of the people.

2. "The Netherlands are said to have been formed by the off-scourings of the Alps." Explain fully what this means.

3. The four largest towns in the Netherlands are Amsterdam (568 thousand), Rotterdam (418), The Hague (270), and Utrecht (118). Describe the position and importance of these towns.

4. From what British ports do steamers run daily to (*a*) Flushing, (*b*) Hook of Holland? What kind of traffic passes through these places?

LESSON XX.

BELGIUM.

1. On a map of Belgium shade the coalfields; mark on the map the chief industrial centres, and the industries carried on at each.

2.

Belgium.		Netherlands.	
Area, - -	11,373 sq. miles	Area, - -	12,648 sq. miles
Population, - -	7,452,000	Population, - -	5,898,500

Find the population per square mile for each country.

3. On a sketch-map of Belgium and the Netherlands (*a*) draw the rivers, and thicken the navigable parts; (*b*) mark as many canals as possible.

Belgium.—The line of the Sambre-Meuse divides Belgium into two natural regions ; (*a*) a low-lying **plain** in which the land never reaches 600 feet in height, (*b*) the Ardennes **plateau**, the average elevation of which is a little more than 2,000 feet.

The plain is crossed by the Scheldt and its tributaries ; gentle undulations of the land separate these rivers, but they are not bold enough to relieve the gentle monotony of the landscape. The coast-line is only 42 miles long, and it consists of stretches of sand ; the coast is of little use except for seaside resorts, and of these the most fashionable are **Ostende** and Blankenberghe. A line of sand-dunes separates the coast from the plain which stretches eastward. On that part of the plain which lies between Ostende and Brussels great numbers of draught-horses are reared ; while in the north of Belgium the land between the Schelde and Maas is the **Campine**, a sandy region with peat and marshes. Cattle are pastured on the grass-lands, and butter is now produced in considerable quantities.

Throughout the Belgian plain the soil is poor, and yet heavy crops are obtained from it by means of incessant labour and careful cultivation. The spade is used more than the plough, and agriculture resembles gardening on a large scale. Cereals (wheat, rye, oats), are largely grown as well as potatoes, flax, hemp, beet and fruits.

The limestones of the Ardennes plateau have been worn out into picturesque valleys by the rivers Ourthe, Lesse and Meuse. **Dinant**, on the Meuse, is noted for its scenery—bold cliffs overhanging both the town and the river. The action of water has also formed caves in the limestone, such as the **grottoes** of **Han**, **Rochefort**, etc., in which stalactites and stalagmites are to be seen. Many parts of the plateau are clothed with forests, and on the grass-covered uplands great numbers of sheep are pastured. There are few towns on the plateau ; **Spa**, however, is famous for its mineral springs.

Industries.—The prosperity of Belgium depends not on agriculture, but on **mining**, **manufactures** and **commerce**. Along the line of the Sambre-Meuse (the division between the plain

and the plateau) are valuable deposits of coal—**Mons, Charleroi** and **Liège** being the chief coal-mining centres. This coalfield extends into France to the **Valenciennes** district, and to the north-east coal appears again in the Westphalian district of Germany. The Belgian coal pits are deep, and the coal seams are thin, hence the cost of production is considerable, and the sale price is relatively high. Coal is imported into Belgium from Germany,

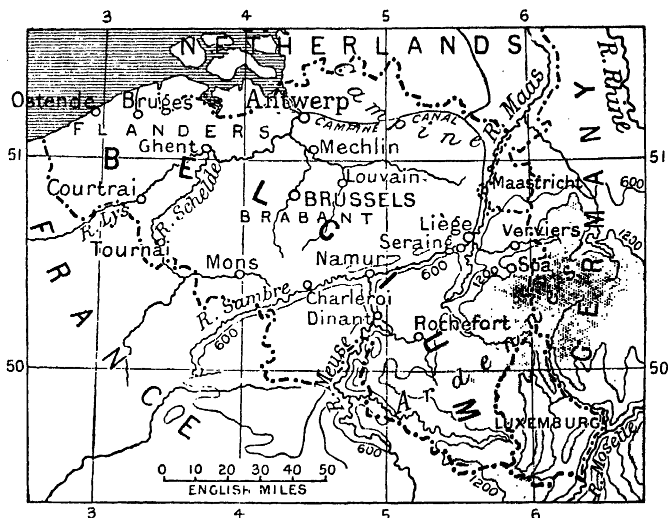


FIG. 33.—BELGIUM.

Great Britain and France. Iron ore is mined both on the coal-field and in the neighbouring duchy of **Luxemburg. Liège** manufactures machinery, steel rails, firearms, as well as chemicals and glass. **Seraing** has large engineering works; **Namur** is noted for cutlery. Zinc and lead are mined near **Verviers.**

In the Middle Ages Flanders was the chief centre of the **woollen industry** in Europe, and Englishmen learnt the art of weaving from Flemings who settled in this country at different

periods. The production of coal and the application of steam-power to machinery have produced in Belgium an industrial development somewhat similar to that in our own country. As Belgium is a small country no places are very far from a coal-field, and so there have not been many changes as regards the centres of industry.

Wool, produced on the Ardennes plateau, accounts for the woollen manufacture at Verviers, an industry which dates back to the fifteenth century. **Flax** is grown largely in the valley of the Lys; in the waters of that river, which are free from lime salts, the stalks of flax are steeped for about six months until the fibres can be separated from each other; this process is called **retting**. Linen goods are manufactured at **Courtrai**, **Tournai** and **Ghent**. **Raw cotton** is now imported from America for the cotton-spinning and calico-printing at **Ghent**. **Lace** is chiefly made by hand at **Brussels** and **Mechlin**—large numbers of girls and women are employed in this work.

Communication.—The Belgian plain is intersected in all directions with **waterways**. Many rivers have been canalised, such as the lower courses of the Ourthe, Lys and Dendre. Above Ghent the Schelde is regulated by means of locks; below Ghent it is navigable to the sea. The Meuse is navigable beyond the French frontier. Canals have been made without difficulty across the level country; two canals connect Ghent to the sea, the first via Bruges and Ostende, the second northwards to Terneuzen. Canals also connect Brussels with the Schelde and Antwerp with the Maas. These and other canals are not only of use for traffic, but they are also of service in draining the lowlands and irrigating districts such as the Campine.

A network of **railways** provides excellent communication with all parts of the country, and the position of Belgium with regard to the rest of Europe is such that **international** railways connect it with France, Germany, Switzerland and Austria-Hungary.

Antwerp is situated most favourably for the internal trade of Belgium, and also for the transit trade of Europe. Centuries ago Antwerp was an important port, but political affairs caused

it to decline. The industrial development of Europe during the second half of the nineteenth century has made Antwerp again one of the chief commercial ports of the Continent. It is now a serious rival of London and of Hamburg. New docks and wharves are being constructed to accommodate the increasing traffic. The canal trade is enormous, and French, Dutch and German barges use the canals without restriction. Antwerp is an outlet for the iron and steel goods manufactured on the Belgian and Westphalian coalfields, while Italian eggs and fruit pass through it on their way to England. Sugar-refining, distilling and shipbuilding, are also important industries at this port.

Brussels, the political capital, is the intellectual centre of Belgium. In recent years, fine buildings, *e.g.* Palais de Justice, Post Office, Exchange, etc., have been erected, streets have been widened and planted with trees to form boulevards, until in appearance the city closely resembles Paris.

Louvain is noted for its university, medical school and breweries.

The people of Belgium belong to two distinct races,

(*a*) north of the parallel of latitude on which Brussels stands live the **Flemings**, who are closely allied in race to the Dutch. They speak Flemish, a language which is similar to German ;

(*b*) south of Brussels live the **Walloons**, a mixture of Roman, Celtic and Teutonic elements. They speak a French dialect.

French, however, is the prevailing language, both for official and literary purposes. In Brussels, public notices are printed in Flemish as well as in French, and even the names of the streets are often put up in two forms. (Compare also the Flemish and French forms, Antwerpen and Anvers, Mechlin and Malines, Ghent and Gand, etc.)

Belgium is the most densely populated country in Europe ; this is due to advanced agriculture and the development of its commerce and manufacturing industries. Both manufactures and industries are carried on in a very thorough manner ;

Belgian firms are able to compete successfully with others in the world's markets. Belgian manufacturers are practical in their methods, and ready to adapt themselves to new conditions. As a rule the people are industrious, thrifty and contented. There seems to be little destitution and unemployment, and perhaps this accounts for the very small number of people who emigrate from Belgium.

Luxemburg is an extension of the Ardennes plateau. It is chiefly noted for **iron ore,** but lead and antimony are also mined. Most of the people get their living by agriculture. The town of Luxemburg occupies a position of great natural strength; the old fortifications have now been converted into fine boulevards and parks.

EXERCISES.

1. The four largest towns in Belgium are Brussels (650 thousand), Antwerp (317), Liège (177) and Ghent (165).
Describe the position of these towns, and connect them with industrial activity of Belgium.

2 "Belgium has been described as the battlefield of Europe." Explain this; give instances of battles that have been fought there, and show that the physical features favour military operations.

3. What advantages does Belgium possess for the manufacture of textiles?
How is it that Belgium can compete successfully with other countries in the commercial markets of the world?

4. Compare the Campine with the Ardennes district.

5. Of what importance is Antwerp to the trade (*a*) of Belgium, (*b*) of Germany?

6. Show that the habits and occupations of the inhabitants of Belgium and the Netherlands have been largely influenced by their environment.

LESSON XXI.

FRANCE—CLIMATE AND PEOPLE.

1. Draw a line on a contour map from Marseilles to Cherbourg; along this line draw a section, using a horizontal scale twice that of the map, and a vertical scale one-tenth of an inch for 1,200 feet.

2. On a physical map of France mark the most important watersheds. Calculate roughly the areas of the following river basins: Seine, Loire and [illegible]ronne. Mark the areas on the map.

3. (i) Find the dis[illegible] Paris to the nearest point (*a*) on the English Chann[illegible] the Bay of Biscay, (*c*) on the Mediterranean.

(ii) What distance (by river) are the following towns from the sea: Paris, Orleans, Lyons, Toulouse and Amiens?

(iii) Measure (*a*) the coast-line from Dunkirk to Biarritz, (*b*) the eastern frontier of France from Dunkirk to the Riviera.

4.

TEMPERATURE AND RAINFALL.

1910.	BREST.		PARIS.		MUNICH.	
	Average Temp.	Rainfall.	Average Temp.	Rainfall.	Average Temp.	Rainfall.
	Fahr.	Inches.	Fahr.	Inches.	Fahr.	Inches.
January,	44°	3·89	38°	3·04	31°	0·92
February,	47·3	5·02	38·5	2·34	33	1·97
March,	48	0·80	39	1·00	34	1·08
April,	49	1·49	43·5	1·87	41·6	3·96
May,	50·7	1·37	51·6	3·34	51·8	3·05
June,	56·5	0·95	58·4	3·37	60·4	5·04
July,	57	2·93	58·6	2·42	59	5·09
August,	59	1·11	59	1·95	58	5·19
September,	56	0·95	53	0·71	49	4·34
October,	53·8	4·04	44·3	3·20	43·6	1·46
November,	49	5·35	39	4·43	35	3·91
December,	48·5	3·43	41·3	1·76	32·8	1·84

Find the position of Brest, Paris and Munich. Draw three diagrams similar to that on p. 210; mark the temperature curves and vertical columns for the rainfall for each month. Under each diagram write the average temperature for the year, and the total rainfall.

5.

DENSITY OF POPULATION.

Department.	Population per square mile.	Department.	Population per square mile.
Seine, - - -	20,803	Alpes Basses, - -	42
Nord, - - -	850	Alpes Hautes, -	50
Rhone, - - -	778	Lozère, - - -	64
Pas de Calais, -	389	Landes, - - -	81
Bouches du Rhone,	378	Corse (Corsica), -	89
Loire, - - -	348	Marne (Haute), -	92
Seine-et-Oise, -	339	Gers, - - -	96

On a map of France shade the departments in the first column green; those in the second column yellow. Mark the chief centres of population in those of the first column, and write across each in the second column one fact to explain the thinness of the population.

France is divided almost equally into two parts, (*a*) a highland region in the south-east, (*b*) a lowland region in the north and west. The most important watershed runs from north to south, separating the Rhone-Saône valley from the rivers which flow into the English Channel and Bay of Biscay.

Climate.—The physical structure of France determines to some extent the climatic conditions and the vegetation of the country. Warm **westerly winds** from the Atlantic, heavily laden with water-vapour, blow over the low-lying lands, and a moderate precipitation takes place; in Normandy the annual rainfall is 21 inches. On the Central Plateau the annual rainfall in many parts exceeds 60 inches. The **marine type** of climate which prevails on the Atlantic coast gives way to greater extremes further east. Near the mouth of the Loire frost

is almost unknown. In Paris, the temperature in winter often falls below freezing-point, while on the high lands of the Central Plateau very cold winds blow in the winter and early spring. Languedoc and Provence, being sheltered by



FIG. 34.—FRANCE: HIGHLANDS AND LOWLANDS.

mountains, have a temperate winter, followed by a hot scorching summer; the climate assumes to some extent an African character, except during those weeks when the cold **mistral** blows from the mountains.

The French people do not belong to one race, but to a mixture of many different races. The most important elements which

make up the French nation are of **Celtic, Teutonic** and **Latin** origin. France stretches from the Mediterranean to the North Sea, and therefore it does not wholly belong to Southern Europe nor to Northern Europe; it shares the features of both as regards variety of soil, climate and productions.

The French **national character** also exhibits a great diversity of traits. In Provence and Languedoc, the vivacity and artistic temperament of the inhabitants (traits common to all peoples of Southern Europe) may be contrasted with the energy, persistence and earnestness shown by people in the north.

French people are, as a rule, imaginative, excitable, fond of society and very hospitable. More than half the population of France live by agriculture, and much of the land is held by small peasant proprietors. In the champagne country, 30,000 acres are in the hands of 17,000 wine growers; on one or two acres a man is able to earn a living, but to do this he is obliged to be hard-working and thrifty. The French artisan is skilful and naturally intelligent; he excels in artistic work and in making fancy goods.

The French have always been a **maritime** people. French fishermen from Brittany and the Biscay provinces still go every year to the cod-fishery on the Banks of Newfoundland. France also possesses a large mercantile marine, while her navy is second only to that of England. France has produced many intrepid explorers and navigators, and in colonisation she was England's most formidable rival. At the present time she owns extensive foreign possessions, such as Algeria, Senegal and Tonking.

The **French language** is derived from Latin, but other languages are spoken in particular parts of the country, *e.g.* Flemish in the north-east, Italian in the mountains of the south-east, the Catalan dialect near the Eastern Pyrenees, the Basque tongue near the Western Pyrenees and Breton in Brittany.

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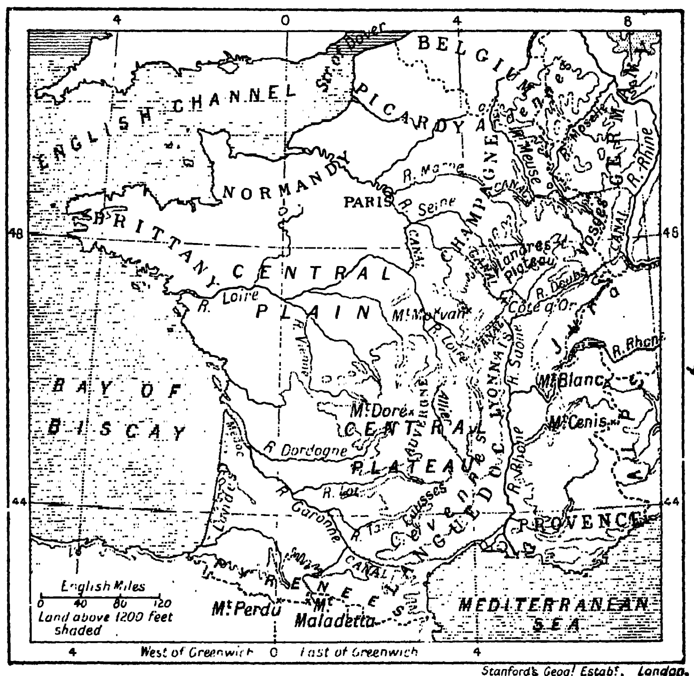


FIG. 34.—FRANCE: HIGHLANDS AND LOWLANDS.

mountains, have a temperate winter, followed by a hot scorching summer; the climate assumes to some extent an African character, except during those weeks when the cold **mistral** blows from the mountains.

The French people do not belong to one race, but to a mixture of many different races. The most important elements which

make up the French nation are of **Celtic, Teutonic** and **Latin** origin. France stretches from the Mediterranean to the North Sea, and therefore it does not wholly belong to Southern Europe nor to Northern Europe; it shares the features of both as regards variety of soil, climate and productions.

The French **national character** also exhibits a great diversity of traits. In Provence and Languedoc, the vivacity and artistic temperament of the inhabitants (traits common to all peoples of Southern Europe) may be contrasted with the energy, persistence and earnestness shown by people in the north.

French people are, as a rule, imaginative, excitable, fond of society and very hospitable. More than half the population of France live by agriculture, and much of the land is held by small peasant proprietors. In the champagne country, 30,000 acres are in the hands of 17,000 wine growers; on one or two acres a man is able to earn a living, but to do this he is obliged to be hard-working and thrifty. The French artisan is skilful and naturally intelligent; he excels in artistic work and in making fancy goods.

The French have always been a **maritime** people. French fishermen from Brittany and the Biscay provinces still go every year to the cod-fishery on the Banks of Newfoundland. France also possesses a large mercantile marine, while her navy is second only to that of England. France has produced many intrepid explorers and navigators, and in colonisation she was England's most formidable rival. At the present time she owns extensive foreign possessions, such as Algeria, Senegal and Tonking.

The **French language** is derived from Latin, but other languages are spoken in particular parts of the country, *e.g.* Flemish in the north-east, Italian in the mountains of the south-east, the Catalan dialect near the Eastern Pyrenees, the Basque tongue near the Western Pyrenees and Breton in Brittany.

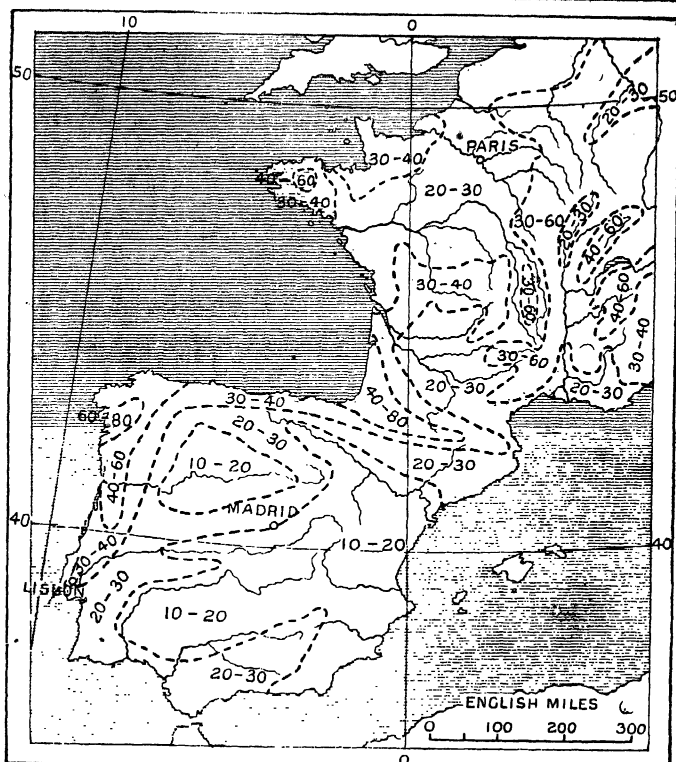


FIG. 35.—FRANCE AND SPAIN: ANNUAL RAINFALL.

EXERCISES.

1. Examine the rainfall map of France (see Fig. 35).

Compare this map with a contour map of France, and point out any connection between the elevation and the distribution of rain.

Compare France and Spain as regards elevation and rainfall.

2. Write an account of the climatic conditions which prevail at Brest, Paris and Munich respectively, using the facts given on p. 116. Explain from these tables what is meant by (*a*) marine, (*b*) continental climate.

LESSON XXII.

NORTH-EASTERN FRANCE.

1.

CULTIVATION OF CEREALS.

Cereals.	Area under Cultivation. 1000 acres.	Total Crop. 1000 bushels.
Wheat, - - - -	16,236	304,399
Barley, - - - -	1,822	42,430
Oats, - - - - -	9,696	301,114
Rye, - - - - -	3,036	50,021
Maize, - - - -	1,224	25,180

Find the total area for cereals, and also the total production. Make a percentage table (*a*) for acres, (*b*) for bushels for each cereal. On paper, squared for tenths of inches, draw squares (sides 2 inches), and shade in the number of small squares for each cereal.

2. Draw a sketch-map of France from the estuary of the Seine to the frontier of Belgium. Mark on it the towns where textiles are made, and the ports through which materials are exported or imported.

3. Draw a sketch-map of the English Channel, and mark the steamship routes by which the Channel can be crossed. Write on the map the distance across the Channel by each route. Show the railways which connect the French Channel ports with Paris.

Seine Basin.—The Seine and Marne flow through the fertile district of **Champagne** before they unite near Paris. Between the valleys are low-lying hills clothed with vineyards, from which the famous sparkling wines are obtained. **Rheims** and Epernay are the chief centres for the preparation and storage of Champagne wine. In 1875 an insect (phylloxera) began to destroy the vines in all the wine-growing districts of France. For a time the French wine trade was in danger of being

ruined. Wine of inferior quality was imported for mixing purposes from Greece, Turkey and Spain. Hardy American vine stems were introduced to take the place of the diseased ones; this, together with the destruction of the phylloxera, has brought about a revival of the wine industry, and France remains the greatest wine-producing country in the world.

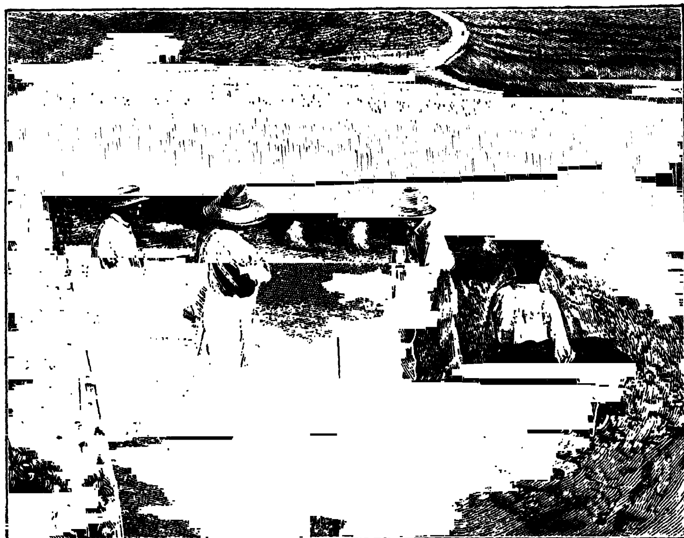


FIG. 36.—A VINEYARD IN CHAMPAGNE.

The Seine flows across the richest agricultural land in France, on which wheat and barley are extensively grown. The country round Paris is of an undulating character; it consists of a series of sedimentary deposits, such as sand, limestone and chalk. East of Paris the land rises gradually until it forms an escarpment facing east; a series of such escarpments form natural lines of defence.

Paris stands at the junction of the Seine and Marne; an

island offered a good position of defence, and round this the city of Paris has grown. The cathedral of Notre Dame is on this island. The modern city is noted for its wide tree-lined streets called boulevards; its fine open spaces, such as the Place de la Concorde; its well-kept gardens and parks and its magnificent buildings, such as the Louvre, Palais Royale, Opera House and Arc de Triomphe. Paris has also many industries, and it excels in the manufacture of fancy goods and articles

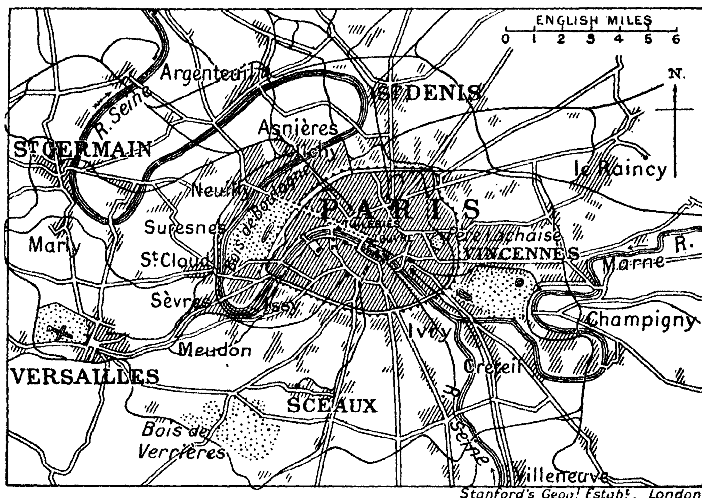


FIG. 37.—PARIS AND NEIGHBOURHOOD.

of fashion. All the important railways of France radiate from Paris as a centre.

The Seine is navigable for small craft down to its mouth, while canals connect it with the Loire, Saône, Meuse and Moselle. Much of the trade of Paris is carried on by means of these canals.

A few miles south-west of the capital is the palace of **Versailles**, once the residence of the most brilliant court in Europe, now a show-place for sightseers.

Rouen is on the tidal part of the Seine; the river has been deepened to allow vessels of considerable size to reach the city. In olden times it was important as the capital of Normandy, and it is rich in historical associations. Rouen, conveniently situated for the importation of raw materials, is not far from a productive coalfield, while canals and railways give it every facility for distributing goods. These advantages have helped to make it a manufacturing centre, and as it specialises in cotton goods, Rouen is often called the Manchester of France. Lace, hosiery and woollen goods are also manufactured.

Havre, at the mouth of the Seine, imports American products as well as English coal. On the plain of Normandy, cereals are largely grown; apples are used for making cider; butter, cheese and eggs are produced not only for home consumption but also for exportation to English markets.

Caen, a small seaport on a maritime canal, is a market-town for agricultural produce. Building stone is quarried in the neighbourhood.

Cherbourg, a fortified naval port on the Cotentin peninsula, is almost opposite Portsmouth.

Dieppe is a watering-place, and a port for cross Channel traffic to Newhaven.

North-East France.—Near the Belgian frontier is the most productive coalfield of France, **Valenciennes** being the centre of the mining area. The presence of coal and the facility with which raw materials can be brought to the district help to account for the great number of industries carried on in the district.

Every town specialises in some particular manufacture.

One of the oldest industries is the manufacture of **woollen goods**; from early times sheep have been pastured on the chalk uplands of Picardy, hence the woollen manufacture at **Roubaix** and **Tourcoing.** Roubaix now specialises in broadcloth, Tourcoing in carpets.

Flax is grown in Belgium, and the fibre is prepared for weaving, and so linen is largely manufactured at **Lille** and **Cambrai** (the latter town gives the name cambric to fine linen

goods). **Lace** is made at **Valenciennes** and **cotton goods** at Lille. During the nineteenth century **sugar beet** has been grown extensively in Picardy and Flanders, in consequence of which **Lille** has become a centre for sugar-refineries, distilleries and breweries.

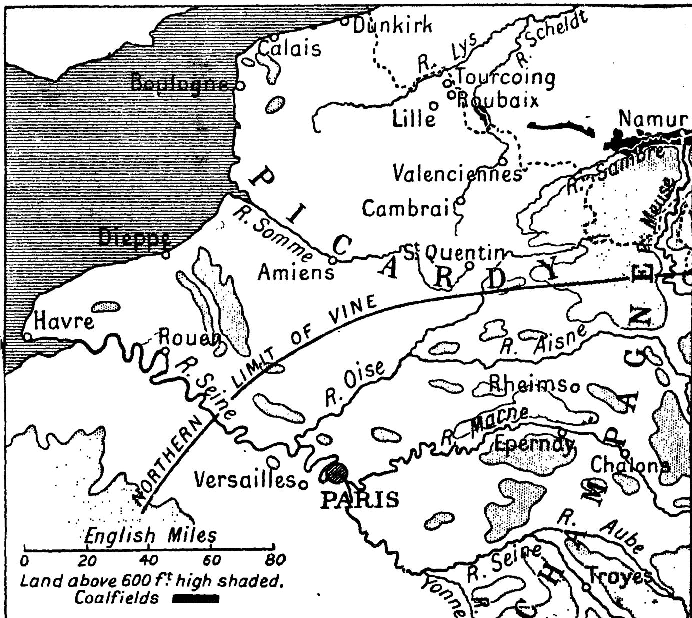


FIG. 38.—NORTH-EAST FRANCE: INDUSTRIAL AREAS.

Amiens, on the Somme, is not far from the coalfield, and here also textiles are manufactured.

Raw materials are no longer produced in quantities large enough to supply the demands of this great industrial region, and so **Dunkirk** has risen to importance as the chief port of entry for the raw materials used in the factories of the district. Wool from South America, cotton from the United States and flax

from the Baltic countries are imported into Dunkirk, while manufactured goods are exported.

Calais and **Boulogne** are chiefly important for cross Channel traffic, both in passengers and goods.

EXERCISES.

1.

STATISTICS OF FRENCH WINE.

	Area under Vines in 1000 acres.	Wine produced. 1000 gallons.	Wine Import. 1000 gallons.	Wine Export. 1000 gallons.
1875	5,549	1,819,994	6,000	81,790
1885	4,917	628,386	170,040	57,259
1895	4,316	592,196	139,832	37,230
1907	4,308	1,272,854	113,850	57,310

Comment on each column in the table. Why does France both import and export wine? How is it that the import of wine was so much greater in 1885 than in 1875, while the export of wine was less?

2. Examine the map of Paris (Fig. 37). Describe the courses of the Marne and Seine so far as they are shown on this map; say what you know of any places on the map.

The cathedral of Notre Dame stands on an island; find its position.

LESSON XXIII.

WESTERN FRANCE.

1. On a map of France measure the shortest distance of the following places from the coast: Bordeaux, Toulouse, Nantes and Orleans.

2. Draw a sketch-map of the Gironde district; mark on it the areas for wine and brandy.

3. "Paris time is now the same as Greenwich time." On this assumption find the time at Brest, Toulouse and Marseilles when it is noon at Paris. Find three places in France which have noon practically at the same time as Paris.

Brittany is a rocky peninsula which projects westward into the Atlantic Ocean. The highlands consist of two ridges of granite hills (Monts d'Arrée) a little more than 1,000 feet in height.

The scenery, climate and formations of Brittany are very similar to those of Cornwall. As it is surrounded with water on three sides and exposed to the westerly wind, the climate is very mild and equable, hence Brittany is noted for early potatoes and fruits; these are sent in large quantities to the London markets. Cattle and poultry-farming, as well as fishing, occupy a large number of the inhabitants.

The old capital of Brittany was **Rennes.** It is well situated for river and canal navigation, and is also a railway centre.

Brest has one of the finest harbours in Europe; it is strongly defended by batteries and has a naval arsenal and dockyard.

L'Orient was founded in 1664 by the French East-India Company, hence its name. During the nineteenth century it became one of the chief naval shipbuilding yards in France. Many of the inhabitants are engaged in fishing.

St. Malo exports agricultural produce to England, via Southampton. From the shallow sandy bay of St. Michael rises a mass of granite nearly 250 feet in height called **Mont St. Michel.** It is surmounted by the remains of a monastery and a fortress.

Loire Basin.—The river Loire is navigable for small craft from Roanne to its mouth. As it leaves the Central Plateau it crosses a district in which rye is largely grown, and then it flows through an extensive plain covered with wheat-fields, fruit-gardens and vineyards. In this part of its course the Loire often overflows its banks and floods the surrounding country; dykes, or **levées**, 20 feet high have been raised in many places to prevent flooding. At **Nantes** it becomes a tidal river, but the detritus brought down by the stream is so great that sand-banks and islands have been formed; in consequence of this silting-up in the estuary, Nantes has declined in commercial importance and some of its trade has gone to St. Nazaire. Nantes is, however, trying to regain its shipping trade

by dredging the estuary, and it also proposes to make a ship-canal.

Orleans is on the Loire, where the river reaches its most northerly point. The city is full of interesting historical associations. The market gardens in the neighbourhood of Orleans supply Paris (only 75 miles distant) with agricultural produce.

Tours is the centre of a fertile district, and woollen and silk articles are manufactured there.

South of the Loire estuary, the shore of the Bay of Biscay is low and bordered by sand-dunes, with salt marshes behind them. The islands Oleron, Rhé and others are separated from the mainland by narrow channels.

La Rochelle, once a stronghold of the Huguenots (French Protestants), is now noted for a shipbuilding industry, as well as for sugar refining and brandy distilling.

Rochefort, nine miles from the mouth of the Charente, is a naval port; **Cognac,** on the same river, is noted for the cultivation of the vine and the distillation of brandy—the name of the town has become a synonym for the best French brandy.

Garonne Basin.—The river Garonne rises in the Pyrenees at the foot of Mount Maladetta; from its source to Toulouse it is unnavigable, and even below Toulouse navigation is impeded, so that a canal is necessary for 120 miles along the right bank. The **Canal du Midi** joins the Garonne with the Mediterranean.

Toulouse has trade with Spain, and manufactures woollens, silk, leather and tobacco.

Bordeaux is well situated for trade (*a*) up the Garonne valley, (*b*) down the Gironde to the sea, and (*c*) by road and railway. Ocean steamers can now reach Bordeaux, as the estuary has been deepened. The road and railway connecting Paris with Spain cross the Garonne at this point.

This town is the centre of a great wine-growing district, and great quantities of wine and brandy are exported. On the lo hills, north-west of Bordeaux, **Medoc** (claret) wine is grown.

From the Gironde to the Spanish frontier the coast-line is unbroken, except by the Basin of Arcachon. Along this coast are extensive **sand-dunes** more than 100 feet in height, and

constantly changing their form according to the winds. Behind the sand-dunes are shallow lakes, called **étangs**, which have been cut off from the sea. East of the dunes is a large stretch of lowland, consisting of deposits of gravel, sand, mud and quagmires.

This area of 5,000 square miles is known as the **Landes**, and it is crossed by many streams from the Pyrenees. The sand-dunes tend to encroach on the Landes, and so a belt of sea pines has been planted from the Adour to the Gironde to hold the sand in check. Canals have also been made to drain off the surplus water, in order to increase the area of fertile land; better drainage has improved the healthiness of the Landes.

Near the mouth of the Adour is **Bayonne**, a strongly fortified town; six miles from it, on the coast, is **Biarritz**, a favourite watering-place.

Pau, on the foothills of the Pyrenees, commands magnificent views of the mountains; it is used by many English visitors as a winter health resort.

EXERCISES.

1. Write an account of the river Loire, and compare it with the Garonne. How do the inhabitants of these valleys get their living?

2. Describe the positions of Orleans and Toulouse, and compare their suitability for trade. Similarly, compare Nantes and Bordeaux.

3. The following places are well-known tourist and health resorts: Biarritz, Pau, Chamonix, Nice and Dieppe. Give the position of each place, and say in each case why people are attracted to them.

4. In what parts of France do people drink wine, cider, coffee and beer? How is it that so little tea is drunk in France?

5. Describe in detail the coast-line of Brittany. Why do many Bretons become seamen? Write an account of the occupations of the people of Brittany.

6. Mention the chief naval ports of France, and point out the position and importance of each.

LESSON XXIV.

CENTRAL PLATEAU—RHONE VALLEY.

1. Make an enlarged sketch of Fig. 40*b*. Mark the names of the rivers, and shade the chief highlands near the frontier.

Draw any important railways which cross the Franco-German frontier.

2. Draw a sketch-map to show the railway route (*a*) from Paris to the Mont Cenis tunnel, (*b*) from Paris to Marseilles.

Find the highest points reached by these railways and mark them on the map. Indicate the sections of the railway which are at elevations above or below 600 feet.

3. Draw a sketch-map to show the area of cultivation for Champagne and Burgundy wines. Mark the land which separates these areas, also the chief towns engaged in the trade.

4. Among the articles imported into the United Kingdom from France every year are the following:

BRITISH IMPORTS FROM FRANCE.

Articles.	Value in £1000.	Articles.	Value in £1000.
Apparel,	1,816	Silk-Broadstuffs,	3,781
Butter,	2,233	Silk-Lace,	246
Motor Cars and Cycles,	2,626	Silk-Ribbons,	640
Lace (Cotton),	1,399	Brandy,	776
Fancy Goods,	407	Sugar (Refined),	1,329
Eggs,	434	Potatoes,	550
Ornamental Feathers,	641	Wine,	1,977
Leather Gloves,	575	Raw Wool,	1,393
Artificial Flowers,	765	Woollen Goods,	3,718

Classify the articles in the above table under the headings: textiles, dress, food, drink, other articles. Find the value of each group.

Which of these articles would you describe as necessaries, and which as luxuries? Which articles are produced in the Rhone Valley?

Central Plateau.—This plateau is composed mainly of hard, impermeable rocks, and its surface has been worn down to some extent by the action of water and weathering. In ages gone by, the rocks were fractured from north to south, and in the valleys thus formed there are now the fertile lands of Limagne, Forez, etc.; while volcanic rocks burst through the surface of the plateau and formed the conical hills which now appear as a remarkable group of extinct volcanoes.

In **Auvergne** are thick beds of lava and cones of extinct volcanoes which rise to a height of 5,000–6,000 feet. Near **Clermont** are many of these **conical hills**, which are locally known as **puys**; hence Puy de Dôme, Puy de Sancy, etc. Clermont stands between a range of puys and the River Allier; its cathedral is built of dark-coloured lava obtained from the neighbourhood. Near Mont Doré sulphur and alum are found, while there are many hot mineral springs in the same district.

The rivers which rise on the plateau flow to the north or the west. The Loire and Allier both rise at an elevation of 4,500 feet above sea-level; they flow down very steep valleys until they unite near Nevers. As they pass chiefly over impermeable rocks they are quickly affected by the rainfall on the plateau; a sudden rise of water in the upper valley is often followed by floods on the plains.

St. Etienne is the centre of a coal-mining district, the second largest coalfield in France; on this coalfield are iron and steel works, and a Government small-arms factory. Silk goods are also made in this district—raw silk being obtained from the Rhone Valley (Lyons is only 36 miles away). Ribbons and laces are made in the homes of the people.

Limoges, on the western edge of the plateau, is noted for kaolin, from which porcelain is made; this manufacture employs 5,000 people.

The southern part of the Central Plateau is a limestone region, called **causses**, the surface of which is almost sterile; it is crossed by deep narrow valleys, in which the water-courses are often dry. Subterranean streams have been formed by the

water sinking through the limestone, while caves, containing stalactites and stalagmites, are numerous in this district.

The eastern edge of the Central Plateau, known as the **Cevennes**, descends abruptly to the Rhone-Saône valley. This escarpment is continued northwards as the **Lyonnais** and the **Côte d'Or**, the two latter being separated by a gap through which the Canal du Centre connects the Loire and Saône. The Côte d'Or is covered with vineyards, and **Dijon** is the centre of the upper Burgundy wine trade; through this town passes the Canal Burgoyne, which joins the basins of the Seine and Rhone, and the railway from Paris to the Rhone Valley.

The **Morvan Mountains** are an outlying spur of the Central Plateau, but are separated from it by the Loire valley. These mountains are composed almost entirely of granite. On their eastern side is **Le Creuzot**, near which coal and iron are found together. At this town are the huge ironworks of Schneider & Co., where the largest cannons are made; locomotives and steel rails are also manufactured.

Between the Morvan Mountains and the Vosges is the **Langres Plateau**; on the northern slope of the plateau are the sources of the Seine, Marne and Meuse. The surface of the plateau is bare and unproductive, while the inhabitants are few in numbers and very poor.

Rhone Basin.—Soon after leaving Lake Geneva the River Rhone enters French territory, and cutting its way through the Jura Mountains, it turns westward and joins the Saône at Lyons. Between Lyons and the Mediterranean it receives many Alpine streams, such as the Isère, Durance and others; all of them bring detritus from the Alps, and this is deposited at the mouth of the Rhone to form the extensive de[illegible]

The land between these tributaries is mountainous, unproductive and difficult to cross, but their valleys provide natural routes into Italy, *e.g.*

(*a*) the Isère is connected with the Dora Baltea by the Little St. Bernard pass;

(*b*) the Arc (a tributary of the Isère), with the Dora Riparia by the Mont Cenis pass.

At **Grenoble** water-power is used in glove factories and paper-works. **Chamonix**, a tourist centre, stands on the Arve at the foot of Mont Blanc.

Unlike the Alpine tributaries, the Saône is a clear, slow-flowing stream, and is navigable for many miles above Lyons.



Fig. 39.—France: Railways and Chief Towns.

On the slopes of the hills overlooking the Saône, Burgundy wine is grown, and in the valley itself **Maçon** gives its name to the best known wine. **Chalon**, at the junction of the Canal du Centre and the Saône, is conveniently situated for traffic, while **Besançon**, on the Doubs, is a fortified town, in which watch-making is the chief industry.

The Rhone Valley is, however, most noted for the production of silk. Mulberry trees grow everywhere, and countless numbers of silk-worms are reared. **Lyons** is the most important centre of the silk trade—the finest silk fabrics are manufactured at this town, the hand-looms and power-looms employing nearly 100,000 people. **Avignon** and **Nimes** are also engaged in the silk trade. On the grass-lands of the delta cattle and horses are pastured.

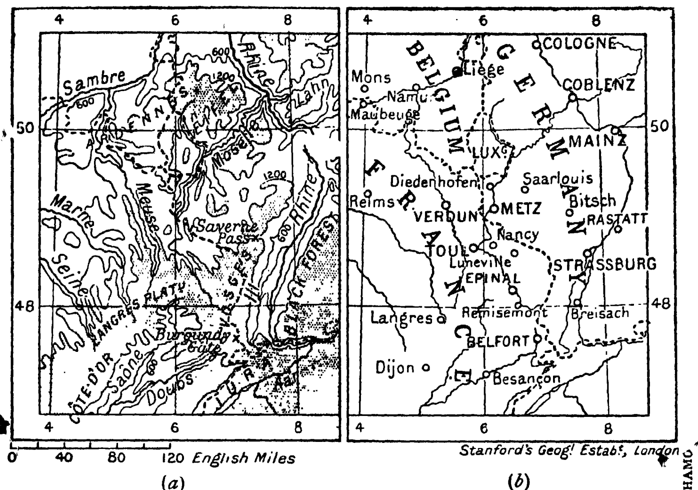
Navigation is possible from Lyons down to Avignon, but against the stream it is very [illegible] on account of the swiftness of the current. The Rh[illegible]alley has, however, always [illegible]ovided a natural route [illegible]ssing northwards from the [illegible]diterranean coast, eit[illegible]eine valley via the Côte [illegible], or to the Rhine V[illegible]rgundy Gate. This [illegible] accounts for the imp[illegible]illes from the earliest [illegible]s. The discovery of [illegible] to India injured the [illegible]ade of Marseilles as we[illegible] Venice and Genoa, but the construction of railway[illegible]ld trade route and the opening of the Suez Canal in [illegible]69, [illegible] revived the trade of Marseilles. It is now the most pro[illegible]rous port on the Mediterranean coast. Marseilles is not [illegible]ly a great distributing centre for all kinds of merchandise, but it is also a great passenger port for all parts of the world. East of Marseilles, **Toulon** is situated on a magnificent harbour; it is the chief French naval port on the Mediterranean.

The coast of **Provence** is sheltered by mountains; the slopes which overlook the Mediterranean are clothed with vineyards, orange groves and olive groves. This favoured region is known as the French Riviera, and is noted for its health resorts, Nice, Mentone, Cannes and others.

Languedoc, a most fruitful province, lies between Cevennes and the Mediterranean. **Montpellier** is a centre of wine production.

Corsica belongs to France, although geographically it belongs to Italy; it is about 100 miles south of Genoa. The interior of the island is very mountainous; on the eastern side is some fertile land, but the coast regions are unhealthy. Fishing and

cattle rearing are the chief industries. Ajaccio is the capital, but Bastia is the most important town in the island. Napoleon was a native of Corsica.



(*a*) (*b*)

FIG. 40.—FRANCO-GERMAN FRONTIER.

(*a*) Physical Features; (*b*) Position of Fortresses.

EXERCISES.

1. Show that the routes of (*a*) the canals, (*b*) the railways of France have been decided largely by the physical features of the country.

How are goods carried by water (*a*) from Rouen to Lyons, (*b*) from Bordeaux to Marseilles?

2. How is it that the Rhone is the only French river which has a delta? Whence does the solid matter come to form the delta?

3. Examine (Fig. 40) the two maps of the Franco-German frontier. Paris, which is considered the centre of defence, is protected by the entrenched camps of St. Denis and Marseilles.

The most strongly-fortified positions are on the German frontier of France; Verdun, Toul, Epinal and Belfort form an advanced line—they are strong places of the first class, and each of them has numerous forts. Maubeuge, Reims, Langres, Dijon and Besançon

form a second line of defence, while near Nancy, Lunéville and Remisemont are isolated fortresses (forts d'arrêt).

On the German side of the frontier the valleys of the Rhine and Moselle are most strongly defended. Cologne, Coblenz, Mainz, Rastatt, Strassburg and Metz are fortified places of the first class, and they serve as camps.

Saarlouis, Diedenhofen, Bitsch, Breisach are fortresses specially designed for railway protection or obstruction.

Point out the relation of the French and German fortresses with regard to each other. Write a list of them. Why have fortresses been designed with regard to railways?

What other countries, beside Germany, border France? What is the relation of France to these countries with regard to defence?

4. Point out the distinguishing features of the following: Causses, Landes, Riviera and Côte d'Or.

5. "Marseilles has more trade than any other seaport on the Mediterranean coast." Explain the reason for this as fully as you can. What kind of trade is carried on? How has the trade of Marseilles been affected (1) by the development of railways in France, (2) by the opening of the Suez Canal?

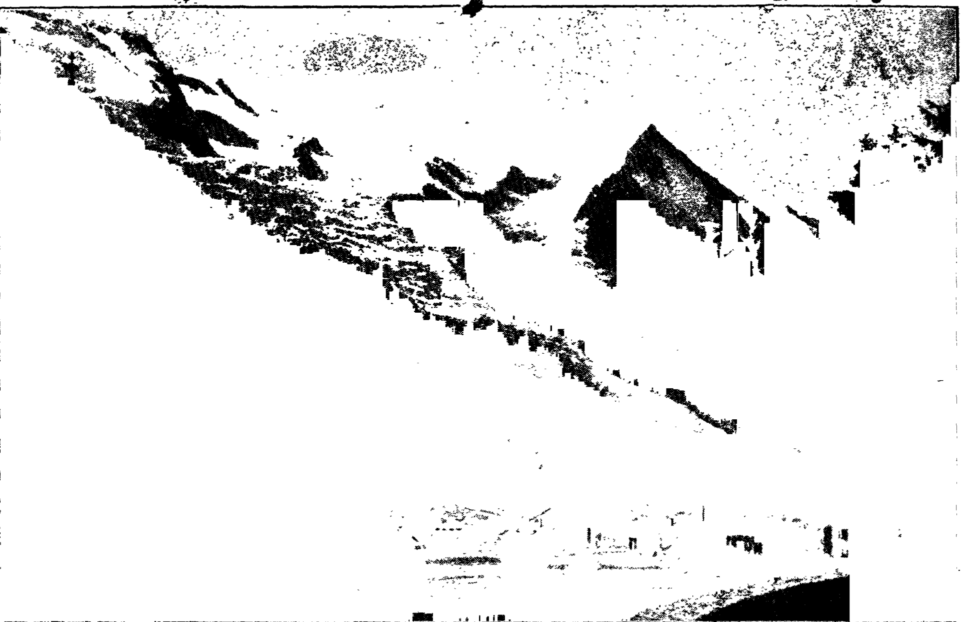
6. The following towns in France have more than 100,000 inhabitants:

CHIEF TOWNS OF FRANCE.

Towns.	Population.	Towns.	Population.
	1000.		1000.
Paris,	2,847	Nantes,	133
Marseilles,	518	Havre,	132
Lyons,	472	Roubaix,	121
Bordeaux,	252	Rouen,	118
Lille,	206	Nancy,	111
Toulouse,	149	Rheims,	110
St. Etienne,	147	Toulon,	104
Nice,	134		

Classify these towns into seaports, manufacturing towns, health resorts, etc.

Give reasons to explain the great population at these places.



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FIG. 41.—CHAMONIX AND MONT BLANC.

PART IV.

THE CENTRAL HIGHLANDS.

LESSON XXV.

THE MOUNTAINS OF SWITZERLAND.

1. From a large map of Switzerland trace the courses of the chief rivers. Without the help of a printed map mark the watersheds with lines. In different colours shade the areas drained by the Rhine and Rhone respectively.

2. Measure from Fig. 46 the area of the snowfields of the Bernese Oberland, and from Fig. 45 of the Pennine Alps and Mont Blanc range.

3. On a map of Switzerland mark the chief railways which cross the frontier; also show the routes taken through Switzerland.

Write outside the Swiss frontier one important town which can be reached by each railway.

4. From the measurements given in the description on p. 146, draw a plan of (*a*) the St. Gothard Tunnel, (*b*) the Simplon Tunnel.

5. Draw a sketch-map to show (*a*) the rivers which rise in Mount St. Gothard, (*b*) the ranges which separate valleys, (*c*) the chief mountain passes across the ranges.

(In all questions, in which sketch-maps are set, the features asked for should be clearly shown and no others; see also Fig. 42.)

Switzerland is the most mountainous country of Europe; its outstanding features are the Alps in the south and south-

east, the Jura mountains in the west, and a plateau between the Jura and the Alps.

The Jura Mountains are composed of **limestone**; the limestone has been folded into a series of parallel ranges, and in the troughs of the **folds** rivers flow in the direction of the main axis, that is in **longitudinal valleys**. The **Doubs** flows in one of these valleys, first to the north-east, and then, cutting through the limestone ridges, it again flows in a longitudinal valley, but in

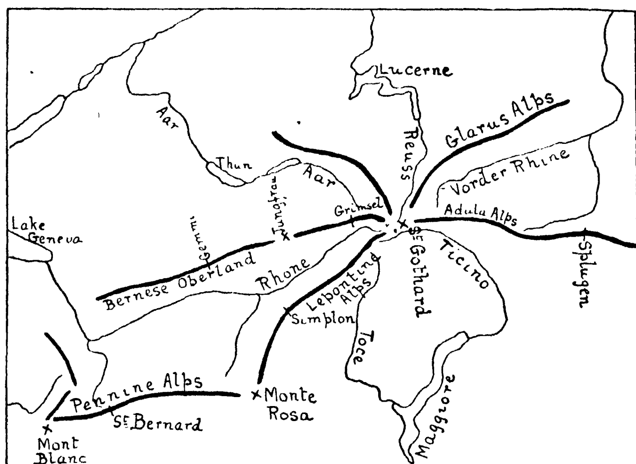


FIG. 42.—Rough sketch-map to illustrate question 5 (p. 139).

the opposite direction. In the Jura, as in all limestone regions, streams disappear and flow in subterranean channels (cf. Karst, p. 175). From this range the term Jurassic is applied to similar limestones (or oolite formations) in other countries, such as the Cotswolds in England.

The Swiss Plateau extends from Lake Geneva to Lake Constance; the elevation of the plateau varies from 1 to 3,000 feet above sea-level; it is composed largely of sandstone, covered with glacial deposits. On the plateau are Lakes Neuchâtel (the largest lake which lies wholly in Swiss

territory), Geneva, Constance and Zurich; while other lakes lie in the valleys which open out on to the plateau, such as

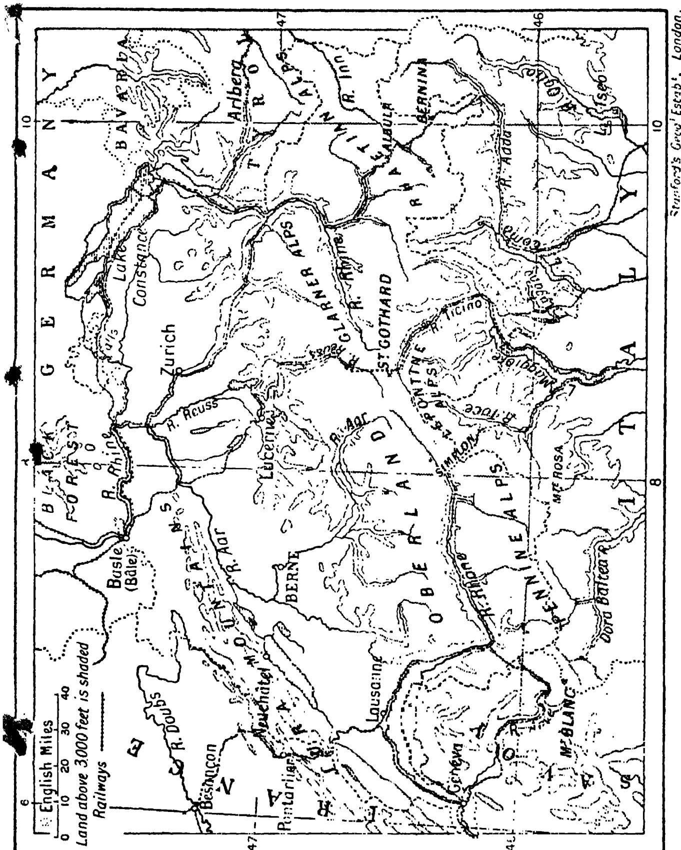


FIG. 43.—SWITZERLAND: PHYSICAL FEATURES AND RAILWAYS.

Zug, Lucerne and Thun. The general slope of the plateau may be seen from the rivers which flow across it in a north-westerly direction to the base of the Jura, where they gradually unite and form one stream, the Aar.

The Alps.—The higher and central ranges of the Alps consist of gneiss, granite and **crystalline** rocks; limestones and other **sedimentary** rocks are found in irregular belts on either side of the older formations. The Alps are mountains of upheaval, and the present arrangement of the rocks is due to compression and crushing, consequently the various strata have been folded and fractured. The great **folds** extend from south-west to north-east, and it is therefore most likely that the thrusts which caused the upheaval and the folding acted from the north-west or from the south-east direction. Denudation, due to ice action and weathering, has worn the surface down to its present shape and condition.



FIG. 44.—Diagram to show the meeting of two glaciers.
B, lateral moraines. C, medial moraines. D, terminal moraine.

It will be seen from the map (Fig. 46) that

(*a*) from the St. Gothard mass, river valleys branch out in all directions, and that the water flowing from this region finds its way to the Mediterranean, Adriatic or North Sea;

(*b*) the Rhone flows in a longitudinal valley from its source, to Martigny, and in a transverse valley from Martigny to Lake Geneva.

As the rivers cut their way through the ranges in transverse valleys they often flow in deep **gorges**, *e.g.* the gorge of the Aar, near Meiringen; the gorge of the Reuss, between Andermatt and Goschenen, etc.

The Rhone Valley (the Valais) is walled in by the Bernese Oberland on the north and by the Pennine and Lepontine Alps

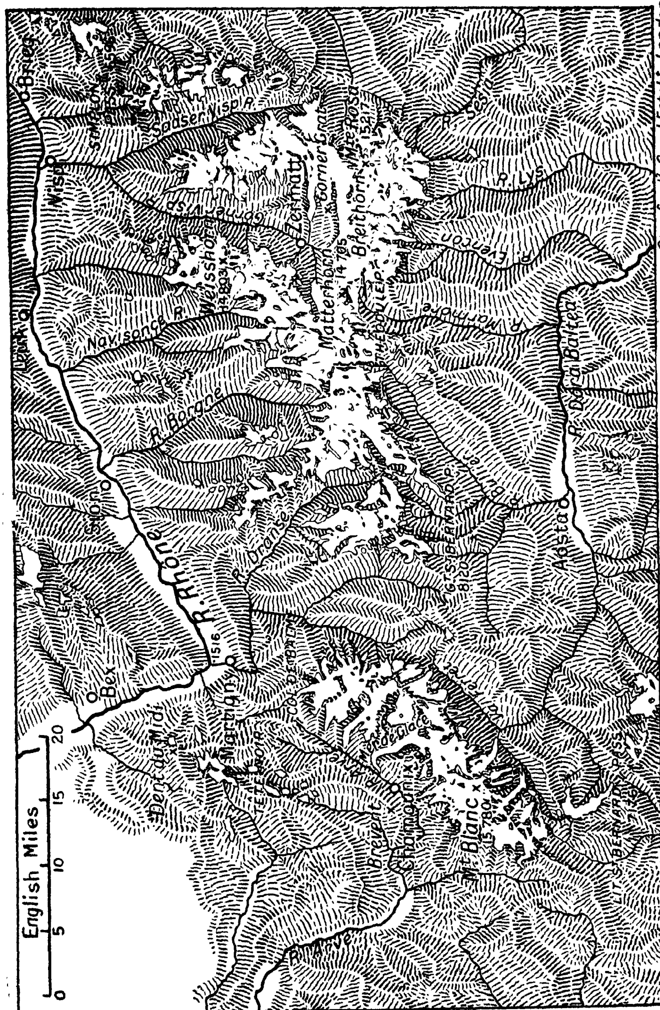


FIG. 45.—PENNINE ALPS AND MONT BLANC RANGE.

on the south. The **Bernese Oberland** (=over or upper land) separates the Rhone from the Aar. More than 20 peaks exceed 12,000 feet in height, and as perpetual snow is reached at a height of 8,500–10,000 feet, extensive snow-fields cover the higher parts of the mass. The **Aletsch glacier** is 16 miles

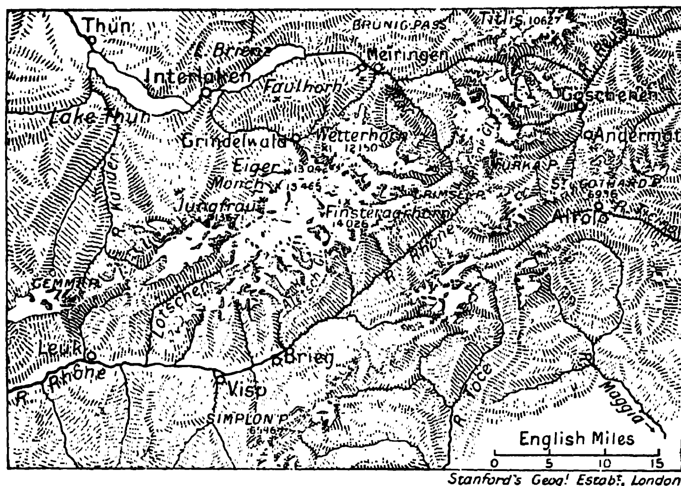


FIG. 46.—BERNESE OBERLAND.

long, and from it rise the snow-capped peaks—**Jungfrau, Finsteraarhorn, Mönch, Eiger**, etc. From the snow-fields glaciers push their way down the valleys below the snow-line.

The **Pennine Alps** separate the valleys of the Rhone and the Dora Baltea; this range contains more than 30 peaks over 12,000 feet in height—**Monte Rosa, Matterhorn, Weisshorn, Mont Blanc**, etc. Except the Matterhorn, all these mountains are covered with perpetual snow. The Matterhorn is a huge mass of rock with such steep faces that snow is unable to rest upon them; the peak towers up majestically above the neighbouring snow-fields. The village of **Zermatt** stands near the foot of the Matterhorn, past which the Visp flows furiously on its way to the Rhone.

Mont Blanc is not an isolated peak, but it is the dome-shaped summit of a mountain mass which overlooks the **Chamonix** valley on one side and the **Aosta** valley on the other. From the Mont Blanc range many glaciers find their way below the snow-line, *e.g.* **Mer de Glace** and **Boissons.**

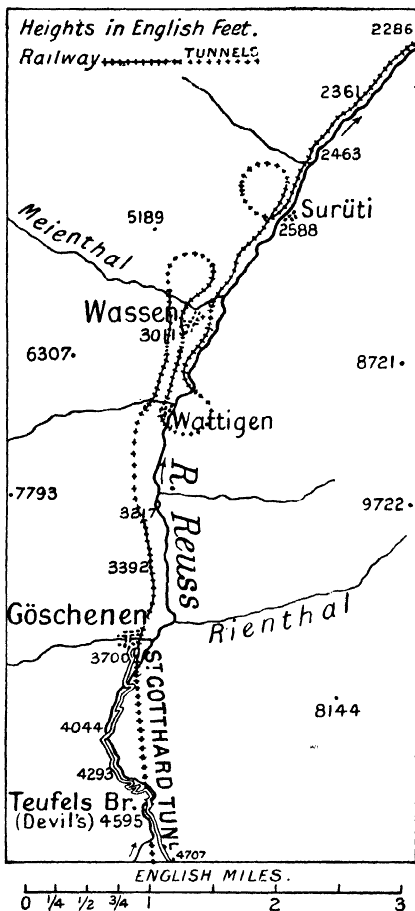


FIG. 47.—THE ST. GOTHARD RAILWAY.

In the **Rhaetian Alps,** in eastern Switzerland, are many lofty valleys, such as the Albula valley, in which **Davos** is situated, and the Engadin, in which **St. Moritz** is situated. Towards Italy the Alps sink abruptly, and so the scenery is grander and more picturesque than on the Swiss side. Vegetation is more abundant, and this adds to the beauty of the landscapes.

Communication. — The **rivers** of Switzerland are too swift for navigation, but on all the large lakes steamers ply regularly during the summer months. Until they were pierced by tunnels, the Alps presented a serious obstacle to through communication. In summer, traffic was

carried on across the high **passes**, but in winter the passes were blocked with snow. Some mountain paths are mere bridle-tracks, but across some passes fine carriage roads have been constructed. Over the **Furka Pass** a zig-zag carriage road reaches an elevation of 7,000 feet, and provides a passage from the Reuss to the Rhone valley.

It should be noticed (Fig. 46) that the **Grimsel**, **Gemmi**, **St. Bernard** and other passes lie between the permanent snow-fields, and so in summer they are open to traffic. A regular postal service is maintained, as long as the passes are open, by clumsy-looking coaches called **diligences**; they carry not only letters, parcels and baggage, but also a limited number of passengers.

Railways have greatly improved communication throughout Switzerland. The Jura mountains are crossed in five places by railways which give direct access to France; the **St. Gothard** and **Simplon** tunnels provide through routes to Italy. Railways cross the Swiss plateau in all directions, Zurich, Berne, Basle, Lausanne, and Geneva being important railway centres. As Switzerland lies between the industrial areas of Germany and Mediterranean ports, traffic from the middle Rhine valley passes via Basle and Geneva to Marseilles, and via the Alpine tunnels to Genoa and Brindisi. Railways also penetrate into the more important Alpine valleys; **mountain railways**, with cog-wheel attachments, climb steep slopes, such as the Rigi, Pilatus, Gorner Grat and Jungfrau, while **cable-worked** lifts, or funiculars, often afford an easy means of reaching hotels situated on the mountain sides.

ALPINE TUNNELS.

Tunnel.	Length.	Width.	Cost per linear yard.
Mont Cenis, - -	8 miles	26¼ feet	£226
St. Gothard, - -	9¼ ,,	28 ,,	£143
Arlberg, - - -	6⅓ ,,	25¼ ,,	£108
Simplon, - - -	12¼ ,,	16 ,,	£148

The central point of the St. Gothard tunnel is 3,786 feet above sea-level; from this point the gradient towards Göschenen is 6 : 1,000, and towards

Airolo 2 : 1,000. Express trains driven by steam-power take 15-20 minutes to pass through. In order to reach the tunnel, both in the Reuss valley and in the Ticino valley, the railway passes through several spiral tunnels (see Fig. 47).

The St. Gothard tunnel was constructed during the years 1872-82.

The Simplon tunnel cuts through the Lepontine Alps; the entrance to the tunnel is about one mile and a half beyond Brieg, and near the Italian side is Iselle. When completed it will consist of two parallel tunnels (one of these was opened for traffic in 1906).

The entrance on the Brieg side is 2,255 feet high, the track ascends for 5¾ miles up a gradient of 2 : 100 in a south-easterly direction; the highest point reached is 2,312 feet (*i.e.* 7,000 feet below the crest of the mountains). For a quarter of a mile it remains level, and then descends to the Iselle entrance by a gradient 7 : 100. This south entrance is 2,155 feet high.

Trains driven by electricity take about 25 minutes to pass through the tunnel. At Cairasca, a little lower down the valley, is a large electric power-house where electricity is generated by the waterfall.

Climate.—In Switzerland variations in climate depend largely on elevation, that is, the climate varies vertically; in the case of Russia the climate varies according to the latitude, that is, horizontally. As a rule, the temperature falls 1 degree for every 300 feet ascended. In Switzerland elevations vary from Lake Maggiore (580 feet) to Monte Rosa (15,217 feet). But the conditions due to mere height are modified by (*a*) the shape of the ground, (*b*) the sheltered position of the place, (*c*) the exposure to the sun. The mountain slopes which face north never receive the direct rays of the sun, while slopes which face south not only receive direct rays but may even receive rays perpendicular to the surface of the ground. On the north side of the range the **snow-line** is much lower than on the south side; vegetation is richer and reaches a higher elevation on the south than on the north side. The length of winter depends largely on elevation: at a height of 2,000 feet it may last for four months; at 6,000 feet for six months; above 10,000 feet winter conditions are continuous.

A great range of temperature is often met with in **Alpine valleys**; in winter, cold mists settle down in the valleys, while on the neighbouring heights the weather is dry and clear; very low temperatures are met with in valleys which open to the east, *e.g.* Urseren valley (on the east side of Mont St. Gothard). In summer the Alpine valleys are frequently very hot; the

mountains keep off cool winds, while in some which open to the north (Reuss, Grindelwald and others) the hot **Föhn** blows with disastrous results.

Westerly and south-westerly winds bring most rain to Switzerland, and on the windward side of the mountains 60-90 inches of rain may fall; in the valleys the rainfall is much less, *e.g.* only 20 inches in the Valais.

EXERCISES.

1. Describe a railway journey from Basle to Italy by the St. Gothard route. Give some account of the scenery on the route.

2. Describe in detail the section of the St. Gothard Railway from Fig. 47.

3. Say what you know of the climatic conditions which prevail (*a*) in Alpine valleys, (*b*) on the high passes.

4. Write a description of the Rhone from its source until it crosses the Swiss frontier.

LESSON XXVI.

THE PEOPLE OF SWITZERLAND.

1. (*a*) The area of Switzerland, 15,976 square miles. Population of Switzerland, 3,742,000. Find the population per square mile.

2.

DENSITY OF POPULATION.

Canton.	Population per square mile.	Canton.	Population per square mile.
Geneva, - - -	1,427	Grisons, - - -	43
Basle, - - -	1,196	Uri, - - -	53
Zurich, - - -	752	Valais, - - -	64
Appenzell, - -	446	Unterwalden, - -	105

The four cantons in the first column have the greatest population per square mile; the cantons in the second column have the least.



The Photochrom Co.

FIG. 48.—INTERLAKEN AND THE BERNESE OBERLAND.
The snow-clad mountains are: Jungfrau, Mönch, Eiger and Wetterhorn.

On a map of Switzerland use two colours, one to shade the densest areas of population and the other, the thinnest population.

3. Of the total area of Switzerland 28.4 per cent. is unproductive. Of the productive area 36 per cent. is grass and meadows; 29 per cent. forests; 19 per cent. wine and fruit; and 16 per cent. crops. What percentage of the area of Switzerland is productive?

Taking the whole area as 15,976 square miles, find the number of square miles given up to (*a*) grass and meadows; (*b*) forests; (*c*) wine and fruit; (*d*) crops.

4. French is spoken chiefly in the following cantons: Valais, Fribourg, Geneva, Vand, Neuchâtel and the Bernese Jura.

Italian is spoken in Ticino and the south part of Grisons. In the rest of Switzerland German is usually spoken.

On a map of Switzerland shade with different colours the German, French and Italian areas. On the French area mark any three names which have a French form; and similarly for the German and Italian areas.

Switzerland is a **Federal Republic**; each canton manages its own affairs, but national affairs are settled by the Federal Parliament, which meets at **Berne**. Since the close of the Napoleonic wars in 1815, the independence of the Swiss confederation has been recognised by the Great Powers of Europe. Hence Switzerland has been free to develop her resources. Although handicapped by the mountainous character of the country, the Swiss have shown themselves to be intelligent and skilful in industrial matters, as well as enterprising in making capital out of the scenery of the Alps. **Alpine scenery** is a commercial asset which yields a large profit.

There is no Swiss **language**; 70 per cent. of the people speak German, over 20 per cent. speak French, and a few in the south speak Italian; many place-names have more than one form, Luzern and Lucerne; Basel, Basle or Bâle.

The distribution of the population depends largely on the physical features. The towns are situated on the plateau,—**Zurich**, **Basle** and **Geneva** alone having more than 100,000 inhabitants each.

In the Alpine valleys are large villages, such as **Grindelwald, Meiringen, Martigny**, etc. In the high valleys are small villages like **Zermatt** and **Andermatt** (matt = meadow); in recent years some of these villages have become tourist resorts, and so fine

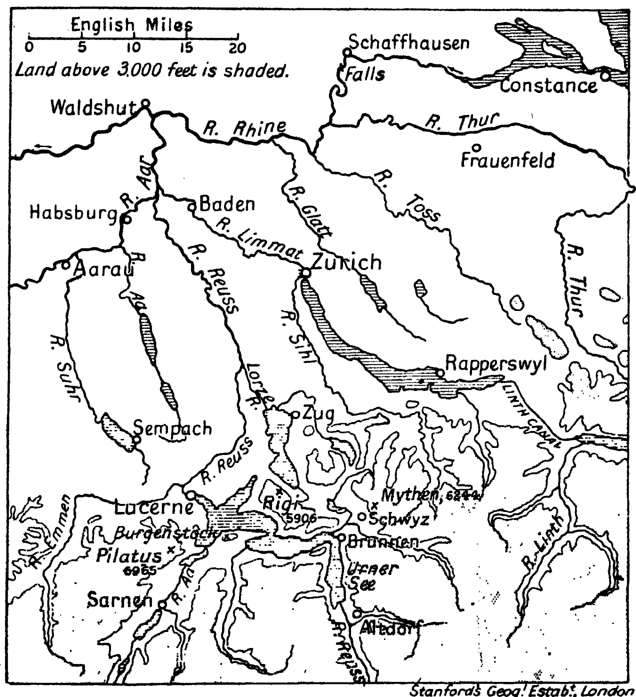


FIG. 49.—SWITZERLAND: ZURICH AND LUCERNE.

hotels have been built. These modern hotels present a strange contrast to the picturesque **châlets** built of wood, and a still stranger contrast to the peasants' huts, in which the cattle live on the ground floor and the peasants in the loft.

On still higher elevations pretentious-looking hotels stand alone, usually in a position which commands extensive

views, *e.g.* Riffelberg Hotel above Zermatt; Rigi Kulm Hotel, etc.

Switzerland has been called the playground of Europe, and the people have been described as a nation of **hotel-keepers.** Every summer Switzerland is visited by a host of holiday-makers, who are attracted chiefly by the magnificence of the scenery. Railways, steamboats and diligences are thronged



FIG. 50.—AN ALPINE VILLAGE.

with tourists, while the hotels are crowded. These visitors provide employment for a large number of people. Switzerland is now becoming noted for its **winter resorts.** Davos, St. Moritz, Grindelwald and other resorts attract people (1) because the mountain air is dry and bracing; and (2) because skating, ski-ing, toboganning and other sports can be enjoyed.

Swiss **guides** and porters are employed by mountaineering parties, especially when the more dangerous mountains are climbed.

Agriculture.—Extensive agriculture is impossible in Switzerland owing to the mountainous character of the country. **Wheat** and other cereals are grown, but the areas of cultivation are restricted to those parts of that plateau which do not exceed 2,500 feet in height. The yield of wheat per acre is only about 14 bushels, while in some parts of England the yield is 30 bushels.

More than half the food supply of Switzerland has to be imported from the neighbouring states.

Flax and **hemp** are cultivated in the cantons of Aargau and Thurgau. **Wine** and **fruits** grow on the southern slopes of the mountains, but rarely as high as 2,000 feet; the chief areas of wine cultivation are Geneva, Neuchâtel, Zurich and Ticino. Herds of **cattle** and **goats** are pastured on the meadow-lands of the plain and on the hill-sides. **Condensed milk** is prepared in large quantities, the well-known Gruyère **cheese** is made in the Canton Freiburg, and **milk-chocolate** at Neuchâtel.

Manufactures.—Although deficient in raw materials and mineral fuel, Switzerland has developed many important industries. The industrial development is largely due to

(*a*) the abundance of **water-power** ;
(*b*) the intelligence and skill of Swiss workmen ;
(*c*) the production of a few articles of excellent workmanship, and of fairly high value.

As the Rhone leaves Lake Geneva its swift-flowing waters are used to generate **electricity** for the purpose of lighting the city of Geneva, and of drawing the electric cars, etc. At Zurich, Rheinfelden and other places, water-power is utilised in many ways. In some mountain villages electric light is cheaper than gas or petroleum.

Machinery, driven by water-power or by electric-power, is now being used in many industrial centres such as **St. Gallen**; but the domestic system of manufacture is still carried on, and much fine work is done in the homes of the operatives. As Switzerland has no coast-line, the manufactured goods must fetch prices high enough to bear the cost of carriage to the

seaports of other countries, in order that they may be exported to distant lands.

Silk goods are manufactured at **Basle, Zurich, Lucerne,** etc.; some raw silk is produced in the southern valleys of Switzerland in Ticino, but a large quantity is imported from Italy via the St. Gothard tunnel.

Raw cotton is imported via Antwerp, Marseilles or Genoa. In St. Gallen **cotton goods** and **embroideries** are manufactured by machinery; in the villages of Glarus—especially in the Linth valley—bleaching, dyeing, printing and other processes are carried on, water-power being largely used in this district.

Watches and **clocks** are made in the villages and towns of the Jura mountains, Le Locle and La Chaux de Fonds, the chief centres, and at places along the base of the range, such as Neuchâtel and Geneva. **Musical boxes** in many forms are made at Geneva.

In the Alpine valleys the peasants often spend their time in winter in **carving** wooden bears, cuckoo-clocks, ornaments, etc., and numbers of these articles are sold to tourists in summer.

EXERCISES.

1. Towns in Switzerland which have more than 30,000 inhabitants are given in the table below:

CHIEF TOWNS OF SWITZERLAND.

Town.	Population.	Town.	Population.
	1000.		1000.
Zurich, - - -	189	Lausanne, - - -	64
Basle, - - -	132	St. Gallen, - -	38
Geneva, - - -	126	Chaux de Fonds, -	38
Berne, - - -	85	Lucerne, - - -	39

Give the position of each town, and account for its being a centre of population.

2. The Swiss possess 1,498,000 cattle; 362,000 goats and 210,000 sheep.

In what way is Switzerland a more suitable country for cattle and goats than for sheep? What articles of trade are associated with cattle and goats?

3. The most important articles sent by Switzerland to Great Britain are given below:

BRITISH IMPORTS FROM SWITZERLAND.

Article.	Value. £1000.	Article.	Value. £1000.
Chocolate, - - -	564	Silk—Broadstuffs, -	1,903
Condensed Milk, -	680	Silk—Ribbons, - -	1,159
Watches and parts of Watches, - -	821	Embroidery and Needlework, - -	1,894

Comment on each article in this table, and point out at what centres in Switzerland these articles are manufactured.

SWITZERLAND—ADDITIONAL EXERCISES.

1. On the map of Switzerland examine the course of the Rhone from its source to Lake Geneva.

(*a*) Draw an enlarged map of the river and the lake; mark the places given below, and enter the distances between the towns; at the side of each town write its height above sea-level.

SWITZERLAND—THE RHONE.

	Distance in Miles.		Height above Sea-Level. Feet.
Rhone Glacier to Brieg, - - -	31	Rhone Glacier, - -	5,775
		Brieg, - - - -	2,245
Brieg to Visp, - -	5	Visp, - - - - -	2,140
Visp to Leuk, - -	12½	Leuk, - - -	2,044
Leuk to Sierre, - -	5½	Sierre, - - -	1,765
Sierre to Sion, - -	10	Sion, - - -	1,710
Sion to Martigny, -	16½	Martigny, - - -	1,542
Martigny to Villeneuve,	24	Villeneuve (that is the level of the surface of Lake Geneva), -	1,220
Villeneuve (at the east end of the lake) to Geneva (at the west end), - -	45		

Lake Geneva has an area of 224 square miles; its greatest depth is 1,090 feet.

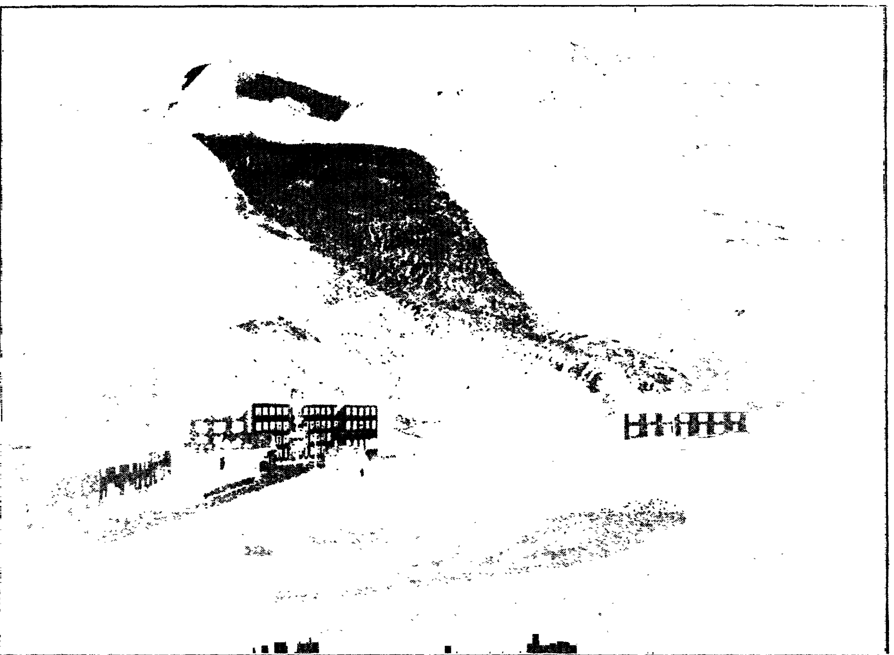


FIG. 51.—THE RHONE GLACIER.
The zig-zag road leads up to the Furka Pass.

(*b*) Find the distance in miles from the Rhone Glacier (the source of the river) to the city of Geneva.

On squared paper draw a horizontal line to represent this distance, using a scale of 1 inch for 10 miles. Along this line mark off the places in the above table to the same scale. Through these places draw vertical lines, using a scale of 1 inch for 1,500 feet. Assuming that the descent is evenly distributed between the given positions, draw the course of the stream.

(*c*) Between which places does the water appear to be flowing (i) most swiftly; (ii) most slowly?

2. Measure (*a*) the greatest length; (*b*) the greatest breadth; (*c*) the area of the following lakes: Geneva, Neuchâtel, Constance and Lucerne.

3. Draw a diagram to show a practical method of finding the height of a mountain.

Under the diagram write what data would be required in order to calculate the height.

4. Draw a diagram to show that the sun's rays may strike the side of a mountain perpendicularly. (See p. 242.)

5. Draw four columns; in the first column write the following names; in the second whether a mountain, river, etc.; in the third, the position; and in the fourth the meaning of the name, or part of the name:

Mont Blanc, Dent du Midi, Oberland, Aiguille, Mer de Glace, Matterhorn, Rosa, Interlaken, Neuchâtel, Pennine and Jungfrau.

6. Draw a diagram to show that the summit of a high mountain is lit up with the sun's rays for some time before a place at the foot of the mountain receives any rays at all.

7. Draw a large sketch-map of the area which lies between Lucerne and Brieg. Mark upon it two possible routes by which a journey may be made from Lucerne to Brieg. Along each route write the method of travelling (whether by railway, steamer, diligence, etc.), and the names of the passes.

8. What rivers rise in Mont St. Gothard? In each case say whether they flow in longitudinal or in transverse valleys.

Where do these rivers enter the sea?

9. Write a list of glaciers that have particular names, and give the position of each. Glaciers have been called "rivers of ice." Criticise this description.

10. Compare Lake Geneva with Lake Lucerne. What mountains overlook these lakes? Can any snow-clad mountains be seen from them in summer?

11.

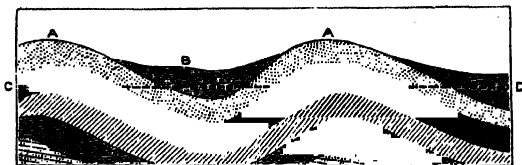


FIG. 52.—FOLDED STRATA.

The arch (A) of the folded strata is called an *anticline*; the trough (B) is called a *syncline*.

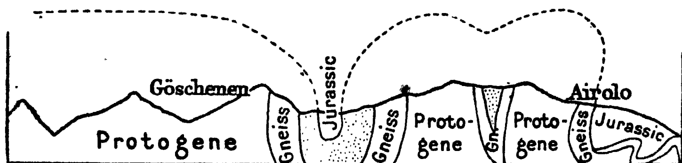


FIG. 53.—FOLDED STRATA IN THE ALPS.

Protogene—an igneous rock-like granite.
Gneiss—composed of the same minerals as granite, but arranged in layers.
Jurassic—limestone.

Describe the folded strata in Figs. 52 and 53. Draw an enlarged diagram of Fig. 52 to show a possible configuration of the surface if the formations above CD were worn down by denudation.

12. Communication between the Alpine valleys is only possible by crossing high passes. Give examples of this, and mention the river valley on each side of the pass.

13. Point out the importance of (*a*) the Great St. Bernard Pass; (*b*) the St. Gothard Pass.

14. What dangers are experienced in climbing high mountains? Illustrate the answer by reference to (*a*) Mont Blanc; (*b*) Matterhorn.

15. In Swiss guide-books, places in the Alps are described as so many hours apart instead of so many miles; for example, Brevent is given as 4½ hours from Chamonix.

Explain clearly why this method is adopted?

16. Describe the position and importance of the four Alpine tunnels (see p. 146).

17. Examine Fig. 51. Describe the picture in detail with regard to (*a*) the glacier, (*b*) the river, (*c*) the roads, (*d*) the buildings.

LESSON XXVII.

THE BAVARIAN HIGHLANDS.

Draw a sketch-map of the area drained by the Danube and its tributaries above Passau. Mark the chief towns and industries of this district.

Also show the important railways which radiate from Munich.

2. On a map of Europe draw lines from Munich to the nearest point on the coast of the Atlantic, Baltic, Mediterranean and Black Sea respectively. Measure the four distances.

On a sheet of paper draw four lines radiating from Munich, using a scale double that of the map. Along each line mark off any important mountain ranges and river which would be crossed in a direct journey from Munich to each coast.

Bavaria.—The kingdom of Bavaria is a plateau, crossed by ranges of mountains; between the ranges are extensive plains and river valleys. The river Main flows through northern Bavaria, but the plateau is chiefly drained by the Danube and its tributaries. The **Danube** rises in the Black Forest; at **Ulm** it enters Bavaria, and from this town it is navigable for boats of 100 tons. Flowing through central Bavaria it reaches its most northerly point at **Ratisbon**, below which steamers navigate the river. Between Ulm and **Passau**, where it leaves Bavarian territory, the Danube receives many tributaries from the Alps; these tributaries not only increase the volume of water in the main stream, but they also give it greater swiftness. In the summer, the melting snows on the Alps keep these tributaries well supplied with water, so that at Passau the River Inn is often at that season larger than the Danube itself.

The Altmuhl, a left bank tributary of the Danube, is connected with the Regniz, a tributary of the Main, by the **Ludwig Canal.** This canal, 110 miles long, crosses the watershed at a height of 1,440 feet. It was only completed in the nineteenth

century, but its commercial importance has already declined owing to the development of railways.

One-third of the surface of Bavaria is covered with **forests**, chiefly pine and fir. The soil is on the whole very fertile and productive; on the plain to the south of Munich **cereals** are grown in great quantities; in the northern districts, especially Franconia, **wine** and **tobacco** are grown, while **hops** are more extensively cultivated in this region than anywhere else in Europe. **Beer** is manufactured in enormous quantities, and much of it is consumed in Bavaria. Next to beer, **textiles** (linens and woollens) are the chief manufactures; of less importance are glass, toys, paper, tobacco, beet sugar, etc.

Munich, the capital of Bavaria, was unimportant until the development of railways in the nineteenth century. It stands at the intersection of the Paris-Vienna and Berlin-Rome railways. Water-power derived from the Isar has helped the manufactures of Munich to increase; breweries take the first place, but wood from the neighbouring forests, and marble from the mountains close by, are made into useful articles by the inhabitants. In recent years Munich has become noted for its educational institutions and as a centre of musical culture.

Nuremberg rose to some importance in the Middle Ages owing to its position at the crossing of highways; in modern times railways have brought some prosperity to the town, and a few industries have developed, although there is no navigable river, no water-power and no coalfield in the neighbourhood.

Bayreuth in northern Bavaria (Main valley) and **Ober-Ammergau** in the extreme south, although very small in size, have become noted, the one as the home of Wagner's opera-dramas, the other for the Passion Play, which is performed by the villagers at intervals of ten years.

EXERCISES.

1. From the statistics of temperature and rainfall on p. 116, describe the climate of Munich. (If the diagram has not been drawn for Munich, it should now be done in accordance with the instructions.)

2. Describe the course of the Main from its source to its junction with the Rhine. How is the Main joined to the Danube? What occupations are carried on in the valley of the Main?

3. Say what you know of the cultivation of hops and beet. What use is made of the forest trees in Bavaria?

LESSON XXVIII.

AUSTRIA-HUNGARY.

1. In Austria-Hungary nine towns only have more than 100,000 inhabitants.

CHIEF TOWNS OF AUSTRIA-HUNGARY.

Town.	Population. 1,000.	Town.	Population. 1,000.
Vienna, - - -	2,031	Graz, - - -	152
Budapest, - - -	732	Brünn, - - -	125
Prague, - - -	225	Cracow, - - -	150
Trieste, - - -	229	Szeged, - - -	103
Lemberg, - - -	207		

On a map of Austria-Hungary mark the towns given above. With Vienna as centre draw circles with radii 50 miles, 100 miles, 150 miles, etc. From Vienna draw straight lines to the towns, and write the distance in miles along each line.

2. On a map of Austria-Hungary (*a*) draw lines to show the watersheds which separate the rivers flowing into the North Sea, Baltic, Adriatic and Black Sea respectively; (*b*) shade the area drained by the Danube and its tributaries.

Austria-Hungary is known as the **dual monarchy**; it is formed of two independent states in alliance with each other, and these states are ruled by one sovereign, who is styled **Emperor** of Austria and **King** of Hungary. The peoples who live in Austria-Hungary differ so much in race, religion and aspirations that there is little cohesion between them, and the emperor himself

seems to be the only bond of union between the various elements which form the empire.

At the end of the eighth century the name Austria (a corruption of Oesterreich = Eastern kingdom) was used as the

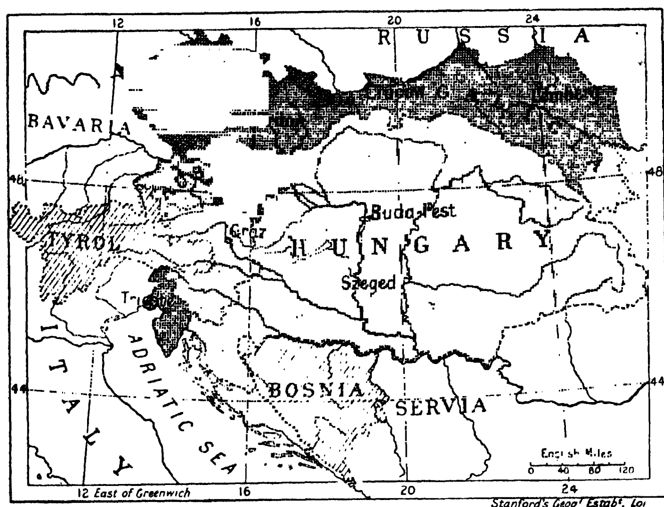


FIG. 54.—AUSTRIA-HUNGARY: DENSITY OF POPULATION.

REFERENCE.

Less than 100 per sq. mile — *e.g.* Tyrol.

100–200 per sq. mile — *e.g.* Hungary.

200–300 ,, — *e.g.* Galicia.

300–400 ,, — *e.g.* Bohemia.

More than 400 per sq. mile, Vienna and district.

eastern mark or border of Charlemagne's empire (ruled A.D. 771-814). After that empire broke up the rulers of Austria became independent, and from the eleventh to the fifteenth centuries they extended their rule over the neighbouring districts, Styria, Carinthia, etc.

In 898 A.D. the **Magyars** or **Hungarians**, a Mongolian race, crossed the Carpathians, settled along the Theiss and middle Danube, and became the dominant race on the plain. The Magyars adopted Christianity, and they established a kingdom which lasted until the invasion of the **Turks** in the sixteenth century. After the defeat of the Hungarians by the Turks in 1526, Hungary was under Turkish rule until the end of the seventeenth century. It was this struggle between Christians and Mohammedans which brought about the union of Austria and Hungary under one sovereign.

The **physical structure** of Austria-Hungary is as diversified as the races of the people who inhabit the country; the **lofty Alps** in the west and south, the **Carpathians** on the east, the **table-land** of Bohemia and the **low-lying plain** of Hungary are its chief parts. The various parts are united to some extent by the Danube, which flows through the heart of the empire, and by its tributaries which rise in the mountainous frontiers of the country.

The **Danube** enters Austria at Passau, near the junction of the Inn; it is already navigable, and it flows through a narrow valley in which the river is hemmed in by rocky banks; the scenery is bold and picturesque and resembles that of the Rhine gorge below Bingen. The valley forms a natural route for communication east and west, and this approach to Vienna is known as the **Austrian Gate.**

Below Vienna the course of the Danube is narrowed at Pressburg, and again at Waitzen, between spurs of the Carpathians on one side and spurs of the Alps on the other. Between these towns the Danube divides and encloses a group of islands—the **Schutten.** Turning south, the Danube enters the great Hungarian plain; in this part of its course the river is liable to overflow its banks, and embankments have been made to keep the water within the proper channel. After the junction with the Drave it is deflected to the east. Below Belgrade the Danube flows for 60 miles through a series of gorges formed by the Transylvanian Mountains on the left bank and the Servian Highlands on the right; the narrowest

part of the gorge near Orsova is known as the **Iron Gate.** Great improvements in the waterway have been made in recent years, so that there is now a navigable channel nearly ten feet deep.

The **Theiss** is navigable as far as Tokay, and the Drave below the junction of the Mur. The Theiss has a very winding course, and many bends have been cut off to shorten it;



Fig. 55.—Austria-Hungary: Highland and Lowland.

embankments have been built, but they have only been partially successful in stopping the floods which turn great tracts into marsh-land.

Climate.—The range of temperature depends very largely on elevation. On the highest ridges of the Alpine region **Arctic conditions** of climate are experienced; the peaks are ice-capped throughout the year. On the Alpine forelands, and on the great Hungarian plain, the range of temperature is very great, as **continental conditions** prevail—the winters being very cold, the summers very hot. On the Karst plateau and in Transylvania the climate is raw and severe. In the Adriatic districts the climate is modified by the sea; these districts, the Adige valley and the Adriatic coast-lands, have the **Mediterranean type** of climate—warm winters, with most rain in the autumn.

Vienna occupies a position of strategic importance. From all directions natural lines of communication converge at this point, and along these routes railways now give access to the city. From Bavaria, the **Austrian Gate** gives a means of approach to Vienna; the **Moravian Gate** from Silesia; the **Hungarian Gate** from Budapest; **Semmering Pass** from the Adriatic; and the **Arlberg tunnel** from France.

The Danube is a splendid waterway, and thousands of river boats reach Vienna in the course of the year.

Vienna is not only the political capital of Austria but it is also the greatest **industrial centre**; minerals abound in the neighbourhood, and are used in the metal industries of the city. Forests provide timber for furniture-making and for fancy goods; and there are mills in which wood pulp is used for the manufacture of paper. The textile industries are also of some importance.

Linz has some river trade and factories for the manufacture of woollen goods, linen goods and tobacco.

EXERCISES.

1. The term *Gate* is used in many parts of Austria-Hungary. Give three examples. Describe the position, and point out the special features of each.

2. Who are (*a*) the Hungarians, (*b*) the Austrians? What languages are spoken by the Hungarians and Austrians respectively? How is it that they are ruled by the same king?

3. What advantages does Vienna possess for (*a*) defence, (*b*) communication, (*c*) trade? Vienna and Nantes are in nearly the same latitude; what conditions determine the climate of each?

4. By what countries is Austria-Hungary surrounded? Point out where physical features form the boundary.

5. Between what limits of latitude and longitude does Austria-Hungary lie? By how many degrees of latitude is Vienna north or south of London? What time is it at Vienna when it is noon at Greenwich?

LESSON XXIX.

THE AUSTRIAN ALPINE REGION.

1. Draw a sketch-map of the Austrian Alpine region; mark the chief lines of communication, and mining centres.

2. Draw a diagram of a mountain slope in the Tyrol; on the slope mark the belts of vegetation met with in passing from the valley to the heights.

3. Measure in miles the course of (*a*) the Inn, (*b*) the Adige, while they flow in Austrian territory.

The **Alpine Region** of Austria extends from the Swiss frontier to the borders of Hungary; its parts are known as Tyrol, Salzburg, Styria and Carinthia, while on the north the Foreland reaches the Danube and on the east it slopes down to the Hungarian plain.

The most important features of this region are shown on the map (Fig. 56).

The **main axis** or **central range** is highest in the west, and many of the heights are covered with snow-fields; the highest summits being Ortler Spitz and Gross Glockner. Towards the east the range descends in height. This central range is composed of hard rocks, among which **granite, gneiss,** etc., occur; it presents a serious obstacle to communication from north to south, except by the depression known as the **Brenner Pass**; this pass affords a convenient route from the Adige valley to Germany via Innsbruck.

North of the central range is a **limestone ridge**, parallel to the main axis and separated from it by a **longitudinal** valley, that is, a valley which runs in the same direction as the mountain range. In this longitudinal valley are the upper courses of the **Inn, Salzach** and **Enns.** Flowing at first towards the east, then turning northwards, they cut through the limestone range in **transverse valleys**; these rivers all enter the Danube. The **Mur**

also flows in a longitudinal valley until it turns southward to join the Drave.

South of the central range there is another limestone ridge, and in the valley, the Pusterthal, flow the **Drave** and the **Adige**; the latter river flows for some distance to the west, and then cuts out a wide valley towards the south.

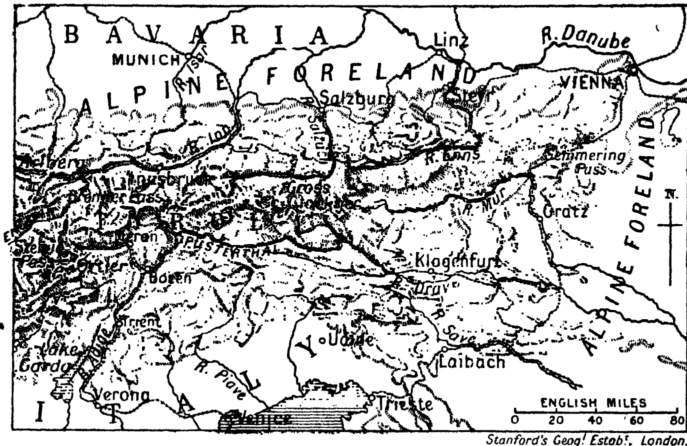


FIG. 56.—THE AUSTRIAN ALPINE REGION.

In this mountainous region are no large towns, the scanty population being distributed in villages in the valleys. **Agriculture** is possible in some of the valleys, and cereals are grown in small quantities. The **vine** and **mulberry** thrive in the sheltered Adige valley (silk is manufactured at Roveredo). On the lower slopes of the mountains are belts of **forest-land**; above the forest belts natural **pastures** extend in some cases up to the snow-line. On these pastures the peasants of the Tyrol keep herds of cattle and goats.

Innsbruck, the capital of the Tyrol, is beautifully situated on the Inn, and is a tourist centre. **Meran** and **Bozen**, in the sheltered valley of the Adige, are winter resorts, and **Salzburg** is noted for its mineral springs.

The Forelands of the Alpine region are very rich in minerals, and mining gives employment to a considerable number of people. **Iron ore** is mined in Styria, especially at Eisenerz, where it is smelted with charcoal. Styria also produces **lignite**. **Lead** is obtained near Bleiberg and **mercury** at Idria, while in the north limestone range **salt** is mined at Salzkammergut. (Salz = salt, hence Salzach, Salzburg.)

Steyr, Klagenfurt and **Graz** are all noted for iron and steel goods; **Graz** manufactures rails and rolling stock.

EXERCISES.

1. The railways of Austria-Hungary keep mostly to the plains and river-valleys. Show that the statement is true, and give any important exceptions.

2. Define longitudinal valley, transverse valley and subterranean drainage; give examples from Austria-Hungary. In what other countries of Europe are similar features found?

3. Give the position of the Brenner Pass, the Semmering Pass and the Arlberg Tunnel. Point out the importance of these to the trade of Austria.

Imports and Exports.

Articles imported into U.K. from Austria-Hungary.	Value. £1000.	Articles exported from U.K. to Austria-Hungary.	Value. £1000.
Barley, - - -	161	Coal, Coke, - -	639
Eggs, - - -	618	Cotton Yarn, - -	521
Glass, - - -	170	Cotton Goods, - -	269
Jewellery, - - -	260	Machinery, - -	463
Gloves, - - -	330	Woollen Goods, - -	381
Poultry and Game, -	107	Woollen Yarn, - -	53
Sugar (Refined), -	3,058	Alpaca, Mohair, etc., -	42
Sugar (Unrefined), -	918		
Wheatmeal and Flour,	128		

Comment (see p. 15) on the above imports and exports. Compare this table with that on p. 88, giving the trade between Germany and the United Kingdom.

LESSON XXX.

BOHEMIA, MORAVIA AND GALICIA.

1. Measure (*a*) the course of the Elbe from its source to the Bohemian frontier;

(*b*) The distance of Prague from Vienna;

(*c*) The area of Bohemia.

2. From the description which follows make a list of all the mineral productions mentioned in the lesson, and the towns which are connected with each mineral. Enter these on a map, and by means of shading distinguish the highland and lowland.

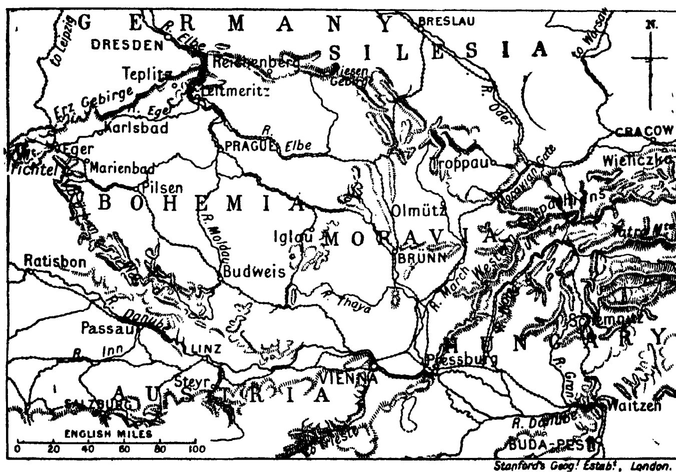


FIG. 57.—BOHEMIA AND MORAVIA.

Bohemia.—It will be seen from the map (Fig. 57)

(*a*) that Bohemia is surrounded on three sides by mountain ranges, while on the south-east the Moravian Heights form a watershed which divides the water flowing into the Elbe from that flowing into the Danube;

(*b*) that the general slope of Bohemia is towards the north.

The **Erzgebirge** (Ore Mountains) rise abruptly from the Bohemian plain to a height of 4,000 feet; along the base of these mountains many mineral springs occur, and to these springs **Teplitz, Karlsbad, Marienbad** and other towns chiefly owe their reputation as health resorts.

The drainage of Bohemia belongs to the North Sea system. The **Moldau** rises in the Bohemian Forest (Bohmer Wald), and turning northwards flows through a deep narrow valley; it is navigable for small vessels as far as **Budweis.** After its junction with the **Elbe,** the general direction is continued into Saxony. The gorge in the sandstones of the Erzgebirge through which the Elbe flows is the only route by which it is possible to leave Bohemia at a lower elevation than 1,500 feet. The railway from Dresden to Prague passes along this natural route.

The surface of Bohemia is hilly in the south, with gentle undulations in the north. The soil is well suited for agriculture, **wheat** and other cereals, **beet, vine, hops, tobacco** and **fruits** being extensively cultivated. **Forests** cover the mountain sides, and the plain in some parts is well wooded; grassy uplands provide **pasturage** for sheep. **Wool** has always been an important product, and woollen goods are manufactured at **Reichenberg.**

Although the mines on the Erzgebirge are no longer productive, the prosperity of Bohemia largely depends on the mineral wealth of the country. **Coal** is mined near Prague and Pilsen, and as elsewhere manufactures have developed in the vicinity of the coal areas. **Iron** is smelted and iron goods are made at Prague. **Kaolin,** from which porcelain is manufactured, is found in the granite districts of Karlsbad. All kinds of **plate-glass** and **cut-glass** are made in the neighbourhood of Pilsen. Water-power is still used in the **cotton-spinning** mills of the Sudetes; wood pulp, obtained from the forest districts, is used for **paper-making.** **Pencils** are made from graphite in the Budweis.

At Pilsen **beer** is brewed in enormous quantities, and **sugar** is prepared from beet.

Prague, the capital of Bohemia, stands on the Moldau, where

islands made it possible to bridge the river. Its position is convenient for communication along the chief valleys of Bohemia. The presence of coal in the neighbourhood has greatly increased its industrial importance.

Bohemia supports a dense population, the industrial north being more densely populated than the agricultural south. The **Chekhs** outnumber the **Germans** by about two to one; the bitter animosity of the races towards each other is frequently manifested in Prague and other populous centres.

Moravia and **Silesia** lie to the east of Bohemia. The River March, flowing southwards to the Danube, is separated from the Oder by land less than 1,000 feet in height. The railway from Breslau to Vienna crosses the depression (known as the **Moravian Gate**) between the Sudetes and the Carpathians.

On the highlands of Austrian Silesia **linen** goods are manufactured at **Troppau** and other towns from flax partly grown in the district and partly imported from Russia. **Witkowitz** is a **coal-mining** centre, and the Carpathians close by produce iron ore.

Moravia depends on **agriculture** and **sheep-farming**, hence the population is much less dense than in the manufacturing districts of Silesia. **Brunn** and **Iglau** manufacture woollen goods from the raw material produced in the surrounding country.

Galicia and **Bukowina** lie on the north side of the Carpathians; **pines** cover the higher slopes of the mountains, **beeches** the lower slopes (the name Bukowina is derived from a word meaning beech). The Carpathian foreland consists of undulating country which rarely exceeds 900 feet in height.

Although the climate is continental in character, like that of Russia, **agriculture** employs a large number of people. **Mineral oils** are obtained in the neighbourhood of Drohobycz from wells sunk into the oil shales beneath the sandstones of the Foreland.

Rock salt is mined in great quantities at **Wieliczka**, near Cracow, while at **Stanislau** the more modern method is employed of boring into the salt bed, forcing water into the boring, and then pumping the brine.

The people of Galicia are mostly Slavonic by race; in Bukowina are some Roumanians. The peasants are very poor and illiterate; they work for very low wages, rye bread and potatoes being their chief food. The trade of the country is chiefly in the hands of Jews.

Cracow is an old Polish city; it is strongly fortified to defend the Vistula valley.

Lemberg is an important railway centre; westwards lines run to Cracow and into Moravia, eastwards into Russia (especially to Kiev and Odessa) while a line crosses the Carpathians to Budapest.

EXERCISES.

1. Compare Bohemia and Moravia as regards physical features and industries.

2. What industrial areas are separated by the Erzgebirge? What similar industries are carried on in these districts? What means of communication are there between the districts?

3. Give the position of the following industrial centres: Pilsen, Troppau and Cracow. Point out the advantages which each town possesses for its particular industry.

LESSON XXXI.

HUNGARY AND THE KARST.

1. On a map of Hungary mark the names of the minerals in the respective districts; shade the agricultural lands and the forest areas.

2. Draw a sketch-map of the coast-line of Austria-Hungary. Mark the routes by which articles of trade reach the coast from the interior.

3. Examine the map (Fig. 59). Notice the extent of the limestone area; find examples of streams which disappear into the ground.

4. Measure on Fig. 58 the length of the Danube so far as it is shown.

Point out where the Danube has tried to shorten its course.

If instead of turning north to Orsova the Danube cut off the bend, find by how many miles it would shorten its course.

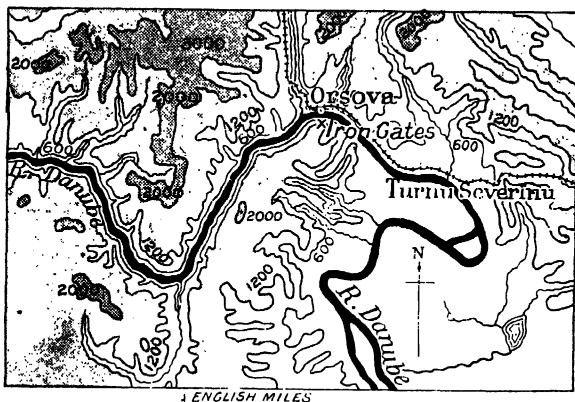


FIG. 58.—THE IRON GATE.

Hungary.—The great plain of low-lying land is the most striking feature of Hungary.

The Little Hungarian Plain (or Pozsony basin) lies between Pressburg (Pozsony) and Waitzen, and is bounded on the east by the Bakony Forest and an offshoot of the Carpathians.

The Great Hungarian Plain lies almost entirely on the east side of the Danube; on the west side of that river spurs of the Alps project into Hungary and separate the valleys of the Save, Drave and Raab. Between two of these spurs is the shallow **Lake Balaton** (Lake Platten), the area of which equals that of the county of Renfrew. The lake is fed by many streams and springs. The springs make the waters of the lake brackish, although the overflow drains into the Danube.

The surface of the great plain is undulating, and its general elevation is about 300 feet. On the whole the soil is very

fertile, and excellent crops of wheat, rye, barley and maize are grown. Hungarian **flour** is noted for its superior quality, and it is exported in great quantities; while flour-milling is one of the chief industries of **Budapest**. **Tobacco** is grown in the neighbourhood of **Debreczin** and **Szegedin**. **Wines** are produced in many districts, but those of **Tokay** and **Carlowitz** are the best known. **Plums**, sold in England as prunes, are grown for export in the Adriatic border-lands of Hungary.

There are many tracts of marsh-land, due to the overflow of the rivers. These tracts are being gradually reclaimed by means of embankments and drainage works. In some parts of the plain are sandy areas, called **Pusstas**, which resemble the steppe-lands of Russia. Tall grasses grow in the spring and early summer and give pasturage to large numbers of sheep and cattle; later in the season the grasses wither, and in winter the Pusstas are swept with storms. This desert region is also being brought under cultivation.

The **towns** on the plain are nearly all agricultural centres, and many of them are of the village type; since the introduction of railways the towns have made rapid progress. **Debreczin**, one of the largest towns, is noted for its horse and cattle markets.

Budapest.—The Magyar town of Pest grew up on the left bank of the Danube, opposite to the older town of Buda. In Buda are the Royal Palace, government offices, etc.; while Pest is rapidly increasing in importance with regard to commerce and industry.

Mining is an important industry of Hungary, but it is carried on chiefly in the mountainous districts. **Coal** is mined on the edge of the plain, in the neighbourhood of Fünfkirchen. No country in Europe produces so much **gold** as Hungary; the most productive mines are in Transylvania and in the mountains near Schemnitz. **Iron, copper, silver** and **lead** are obtained from the Carpathians, **salt** and **petroleum** from Transylvania.

Klausenburg is the chief centre of population in Transylvania.

On the uplands between the Save and Drave deciduous trees grow, especially the oak, poplar and acacia; the **timber** from

these forest lands is exported from Fiume, some of it to France for wine casks and some to Sicily for orange boxes. **Fiume** is the only port of Hungary; grain and flour are also exported.

The Karst. — The name Karst is applied to the limestone formations which stretch in a south-easterly direction from the locality of Trieste to the borders of Montenegro. The strata of this area have been compressed into folds, and under the action of weathering the surface features have become rounded, thus producing plateaux rather than narrow ridges. In the limestone, funnel-shaped hollows are frequently met with; they are called **dolines**, and have been formed by water dissolving out the limestone.

FIG. 59.—THE KARST PLATEAU AND DINARIC ALPS.

The limestone areas are shown thus 

Although the rainfall in this district is heavy, the water does not form rivers flowing in valleys on the surface, but it passes into the limestone and flows in underground channels. Where streams do flow for a short distance they usually disappear in fissures. In some cases these subterranean rivers emerge again as streams of considerable size; in other cases the water appears as springs on the hill-side, or even in the sea.

In consequence of this subterranean system of water-courses the surface is left dry and barren—trees do not flourish, and the arid soil is unsuitable for cultivation. The Kart region is made more inhospitable still by the fierce gusts of the **Bora** (see p. 184) which sweeps across it and injures the more fertile lands on the Adriatic seaboard.

From the Karst to the Adriatic the descent is steep, and communication from the interior to the sea is very difficult. There is only one important break in the coast range, namely, the valley of the **Narenta**, and this route is of little use owing to the steepness of the road and the silting-up of the river mouth. The channels between the islands and the mainland, and the deep indentations into the coast-line, have been formed by a sinking of the land by which the valleys have been *drowned* (see p. 34).

The **maritime trade** of Austria-Hungary is much hampered by the character of the coast-line. **Trieste** has few natural advantages—its harbour is an artificial one and inaccessible when the Bora is blowing. The Austrian Lloyd Company has its headquarters here and has a considerable share in the trade of the eastern Mediterranean. Trieste is connected with the interior by the Southern Railway (from Vienna), but this is inadequate for its growing trade.

Fiume, the Hungarian port, is the chief rival of Trieste. Its trade with western countries is rapidly growing.

Between Trieste and Fiume, on the peninsula of Istria, is the Austrian naval port of **Pola**.

Bosnia and **Herzegovina** now form part of the Austrian Empire. Since the government of the country was taken away

from the Turks (1878) and given to Austria the country has developed rapidly in population and trade. Roads and railways have been constructed to improve communication.

The whole country is mountainous; dense forests cover half its area, and timber is an important article of export. Coal, iron and salt are mined.

EXERCISES.

1.

HUNGARY—CLIMATIC CONDITIONS AT DIFFERENT ELEVATIONS.

Town.	Height above Sea Level.	Average Temperature.		Rainfall in Inches.
		January.	July.	
	Feet.	Fahr.	Fahr.	
Budapest,	502	31°	69°	24·0
Fiume,	16	44	73	70·4
Agram,	534	34	70½	34·3
Debreczin,	423	29	70	22·3
Szeged,	312	31	71	25·9
Schemnitz,	2,037	28	65	35·3
Hermannstadt,	1,357	26	69	28·7

Examine the above table.

(*a*) Find the position of each town.

(*b*) Comment on the temperatures for January and July.

(*c*) What information can be gained from this table with regard to the climate of Hungary?

2. Compare the points in the course of the Danube (*a*) where it enters, (*b*) where it leaves Austria-Hungary.

3. What industries are carried on (*a*) on the Great Hungarian Plain, (*b*) in the mountainous districts of Hungary? What circumstances have retarded the material progress of Hungary?

4. Find the latitude of Trieste. Draw diagrams to show

(*a*) The altitude of the sun at Trieste on December 21st and June 22nd respectively.

(*b*) The variation of day and night for the same dates.

(*c*) The apparent path of the sun throughout the year (see pp. 242-4).

5. The values of the minerals and furnace products of Austria-Hungary are given below :

MINERAL PRODUCTS.

	Austria. Value £1000.	Hungary. Value £1000.
Common Coal, - - -	5,291	678
Brown Coal (Lignite), - -	5,275	2,545
Raw Iron, - - - -	4,410	1,703
Lead, - - - - -	197	—
Quicksilver, - - -	122	—
Zinc, - - - - -	238	—
Silver, - - - - -	145	46
Copper, - - - -	56	—
Gold, - - - - -	20	433
Graphite, - - - -	66	—
Salt, - - - - -	1,948	—

Compare Austria with Hungary as regards mineral products.

Which of the above products have helped the industrial development of the country ?

From what districts are the minerals obtained ?

6. With what countries does Austria-Hungary carry on most trade ? Of what importance are Trieste and Fiume as seaports ?

PART V.

THE MEDITERRANEAN REGION.

LESSON XXXII.

THE MEDITERRANEAN SEA.

1. Measure the following distances:

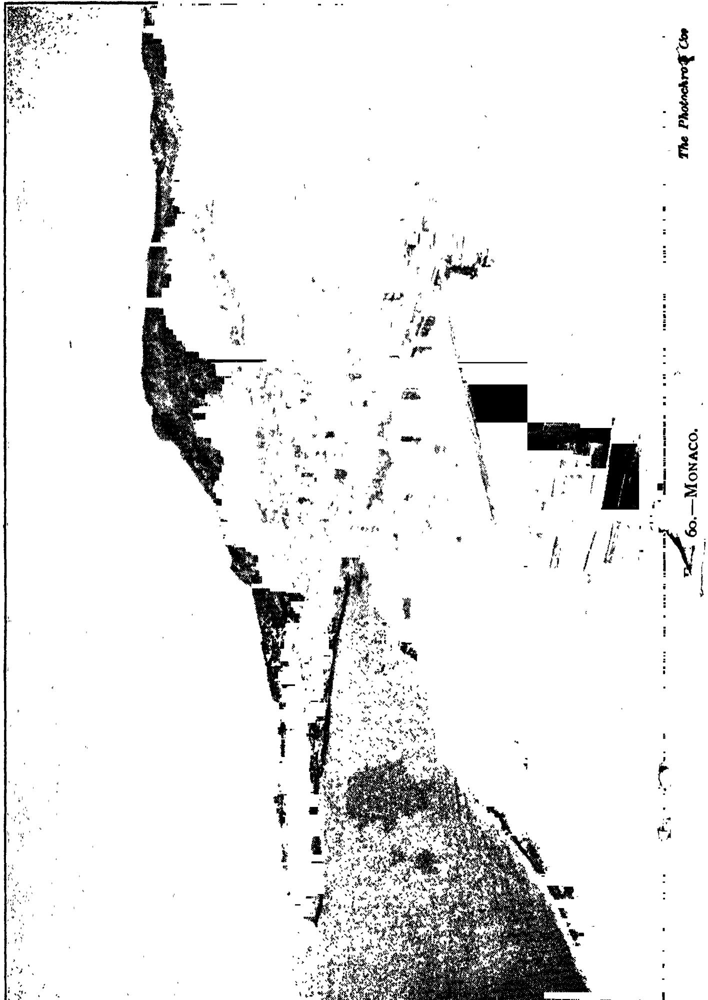
(*a*) Marseilles to the nearest point on the coast of Africa;
(*b*) Marsala to Cape Bon (nearest point on the coast of Africa);
(*c*) Venice to Brindisi;
(*d*) Gibraltar to the coast of Syria.

2. On a map of the Mediterranean mark the course of a steamship which calls at the following ports: Gibraltar, Barcelona, Naples, Brindisi, Patras, Canea, Odessa, Poti. Find the approximate length of the ship's course. Under the name of each town on the map write one article of commerce that can be obtained at that port.

3. Using transparent squared paper, estimate the area of Sardinia, Corsica, Sicily and Crete. Arrange the islands in order of size; then, in tabular form, give for each island

(*a*) the position as regards latitude and longitude;
(*b*) the greatest length;
(*c*) the chief town.

The Mediterranean.—In ancient times the civilisations of Phoenicia, Carthage, Greece and Rome flourished on the shores of the Mediterranean Sea. In those early times the Sahara desert presented a formidable barrier to the south; to the east, the deserts of Syria and Persia were difficult to cross;



The Photochrom Co.

60.—MONACO.

lofty mountains and dense forests obstructed any advance to the north; while westwards the timorous sailors were stopped by the vast Atlantic. Human activity was therefore confined within these limits, and so the word Mediterranean, which means *the middle of the land*, was fittingly applied to this great sea. In this region, too, many terms were first used in a geographical sense, such as *delta* (of the Nile), *isthmus* (of Corinth), *archipelago* (of Aegean islands), as well as volcano, peninsula, etc.

On the Mediterranean Sea men first acquired some knowledge of **navigation.** Phoenician traders traversed it in all directions; Greek and Roman fleets fought battles upon it. Later, in the Middle Ages, the merchant fleets of Venice, Genoa and Marseilles contended with each other for trade supremacy. The discovery of the sea-route to India (1497) round South Africa, took from the Mediterranean ports the trade in Eastern products and transferred the trade to Lisbon, then to Antwerp, and finally to London. Since the opening of the Suez Canal in 1869 the Mediterranean has become a highway of commerce to India, China and Australia. The importance of this route to British commerce is so great that a squadron of the British navy, having its headquarters at Malta, is stationed in the Mediterranean to protect ships passing through it.

The Mediterranean Sea is almost land-locked; the only natural outlet to the ocean is the Strait of Gibraltar, 9 miles wide. In consequence of this it is uninfluenced by ocean **tides,** while on the other hand it is not large enough to generate important tides of its own. There is, however, a rise and fall of a few inches: at Zante it is 6 inches, and at Venice, in the bottle-necked Adriatic, the rise is often 2 to 3 feet. The slight movement of the water in the Mediterranean also favours the formation of **deltas,** as in the case of the Rhone, Nile and Po.

On the contour map two **deep basins,** one between Sicily and the Syrian coast, the other between Sicily and Gibraltar, are shown in contrast to the shallow Adriatic Sea. The waters of the Mediterranean are salter than those of the ocean; this

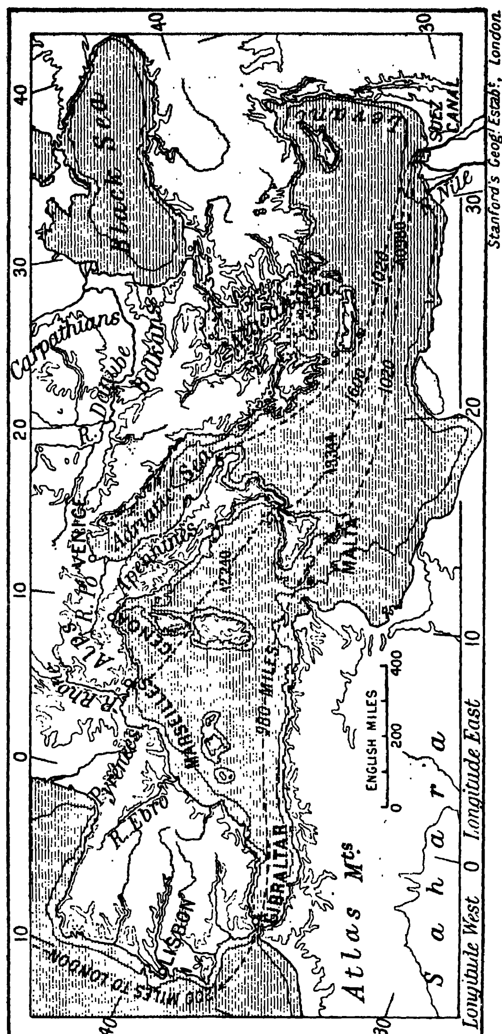


FIG. 61.—THE MEDITERRANEAN REGION.

Contour of height 600 feet; contour of depth 600 feet; greatest depth 13,344 feet.

is accounted for by the small rainfall, great evaporation and the small number of rivers which enter the sea; it may also be mentioned that through the Strait of Gibraltar there is an inflowing surface current, while a counter current flows outwards along the bed of the strait.

Climate.—The Mediterranean region is situated almost entirely between latitudes 30° N. and 45° N. Its position therefore is **sub-tropical**, and it is far enough from the equator to be free from very high temperatures, and yet near enough to be spared the extreme cold of higher latitudes. This sub-tropical position, together with the protection from cold winds afforded by the Alps and other mountain ranges, gives the Mediterranean one of the most favoured climates of the world. On the whole, the climate is mild, for the sea itself exerts an equalising influence upon the temperatures, but elevation gives to some parts of the region a much more varied climate. Except on the mountains, the temperature in the coldest month of the year is always well above 32° F. (see Fig. 16); in this region the sea never freezes.

Winter Rains.—From a map of the world, on which the wind regions are marked, it will be seen that the **north-east trade-wind** belt lies between the equator and 30° N. When the sun is north of the equator the influence of the north-east trade-winds is felt in the Mediterranean region; hence in some parts, especially south of latitude 40°, the summers are dry and almost rainless. Probably the Etesian (or annual) wind which is met with in the eastern part of the region is a modification of the trade-wind.

When the sun is south of the equator the influence of the **westerly winds** predominate, and so most rain falls during the winter; at this season of the year the land is colder than the sea, and so the water-vapour brought by the westerly winds is more readily condensed, and precipitation takes place. The rains, however, are not steady and continuous, but are separated by intervals of fine, bright weather. On the southern slopes of the Alps the rainfall is heavier than in the other parts of the region, but even there the number of clear days is very great.

Variable Winds.—There are many variable winds which affect particular localities; of these the **Mistral** is a cold north-west wind which blows from the Cevennes and the Alps across Provence and the Marseilles district. At the end of the winter and in the early spring it blows most violently, and does great injury to vegetation.

The **Bora** is a cold wind which blows in repeated gusts from the high Alps to the warm Mediterranean; it is met with on the west coast of the Adriatic Sea, from Trieste to Albania.

The **Sirocco** is a strong south wind, which has its origin in the Sahara; it is scorchingly hot, laden with dust, and is so dry that the ground cracks and vegetation withers. In Sicily and Southern Italy it blows most commonly in the spring, but occasionally it blows at other seasons.

The **Solano** is a moist east wind which affects the east coast of Spain.

Vegetation.—The moderate rainfall, interspersed with periods of evaporation, does not favour the growth of forests. North of latitude 40° rain falls most abundantly in the winter season, but even during the summer there are occasional showers. Small trees and evergreen shrubs, such as laurel, myrtle and holly, grow best. In the well-watered plain of Lombardy the **mulberry** tree thrives; on the lower slopes of the Alps are **chestnut** groves, and on the southern slopes of the Apennines the **olive** flourishes. The **vine**, having a long root, grows well throughout the region.

South of latitude 40° N. the winter rains are not abundant, while little or no rain falls in the summer. As the temperature is high throughout the year, vegetation depends almost entirely on the rainfall. During the long dry summer, plants cease to grow, but as soon as rain falls in autumn they show signs of life by putting forth new leaves. For this southern part of the Mediterranean region, winter is the period of growth, summer the period of rest; in England exactly the opposite takes place. Only those plants which have thick leathery leaves, and are able to retain moisture, survive the long summer droughts; among these are the **orange**, **lemon**, dwarf **palm**, **almond** tree, etc.

On the dry table-lands of Spain and Algeria grow drought-resisting grasses (like esparto), as well as thorny leafless shrubs.

EXERCISES.

1. Compare the Mediterranean with the Baltic as regards size, climate and commercial importance.

2. "Venice and Odessa are almost in the same latitude." How is it that the water in Odessa harbour freezes every year, while that at Venice never freezes?

3. What winds blow in the Mediterranean region? Point out where they blow, and give some account of them.

LESSON XXXIII.

THE IBERIAN PENINSULA.

1. On an outline-map of Spain and Portugal mark, with different colours, areas for (*a*) forests, (*b*) grass, (*c*) fruit, (*d*) wine, (*e*) cereals, (*f*) waste land.

2. On a sketch-map mark clearly

(*a*) the main watershed which separates rivers flowing into the Atlantic and Mediterranean;

(*b*) any three other watersheds.

Then draw the courses of the chief rivers, and thicken the parts of the river courses that are navigable.

Measure the length of the longest river, and write its length on the map.

3. On a contour map draw a straight line from Malaga to Gijon. Draw a section along this line, using a vertical scale of half a inch for 6,000 feet; horizontal scale twice that of the map.

4. On an outline map of Spain and Portugal mark the towns given in the table, p. 200. With Madrid as centre, draw a series of concentric circles, 100 miles apart, until every town is inside a circle. Draw straight lines from Madrid to the towns, and along each line write the distance from the capital.

5. Every year Spain sends articles to the United Kingdom of the average value of £13,598,000. The most important of these articles are given in the following table:

BRITISH IMPORTS FROM SPAIN.

	Value in £1000.		Value in £1000.
Iron Ore, - -	3,780	Oranges, - - -	1,924
Lead, - - -	1,197	Cork, - - -	296
Quicksilver, - -	305	Onions, - - -	578
Copper, - - -	1,198	Wine, - - -	441

Draw a circle (radius 3 inches) to represent the value of the articles sent from Spain to the United Kingdom. Divide the circle into sectors, as in Fig. 10, to show the proportion of the values in the table.

The Central Plateau.—The greater part of the Peninsula consists of a plateau, the general elevation of which is above 2,000 feet. This plateau extends northwards as far as the Cantabrian mountains, and its southern edge is formed by the Sierra Morena. On the eastern side of the plateau, an irregular mass of mountains stretches from north to south, and forms the chief watershed of the country. From this watershed there is a gradual slope westward to the Atlantic, and down this long slope flow the rivers **Douro, Tagus** and **Guadiana.** The mountains which form the northern and southern edges of the plateau are rich in minerals. **Iron ore** is extensively mined in the Basque Provinces of the Cantabrian mountains, and **coal** in the Oviedo district. In the Sierra Morena, **lead** is obtained near Linares, **quicksilver** from Almaden, and **copper** from the Rio Tinto district.

Mineral springs also occur near the borders of the central tableland.

Shut off from the sea by high mountains, on which condensation takes place, the plateau is deficient in rain; while the temperature is as a rule very high in summer and very low in winter. After a scorchingly hot day in summer the temperature often falls rapidly as soon as the sun has set.

The **Sierras de Guadarrama** and **de Gredos** rise more than 4,000 feet above the general level of the plateau, and they divide it into two parts nearly equal to each other. The ridges of these mountains often stand out clearly against the sky as **sierras** (or saws); the lower slopes of the mountains are scantily covered with grass and stunted shrubs. These ranges can only be

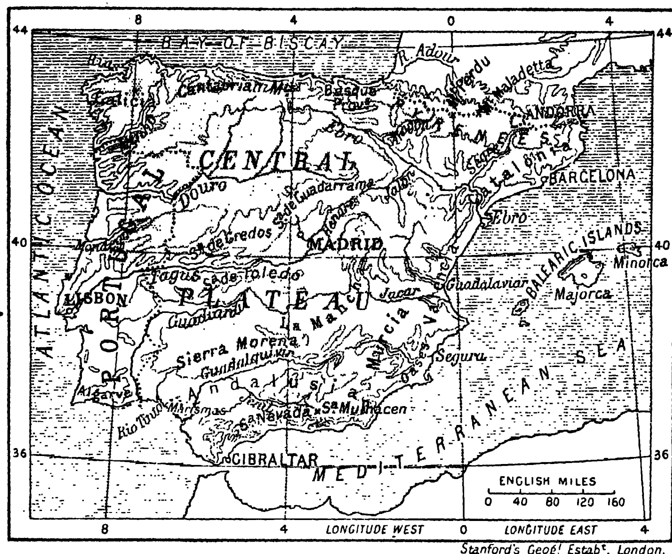


FIG. 62.—THE IBERIAN PENINSULA.
The shaded area is more than 1200 feet in height.

crossed at high elevations, and so communication from north to south is seriously obstructed by them.

Between the Guadarrama and the Cantabrian mountains is the broad plain across which the **Douro** flows; the Douro brings down a small volume of water, and it is unnavigable until it approaches the sea. The plain is very dry and almost treeless, except near water; the vegetation consists of **evergreens** of low growth and scanty foliage, prickly plants, etc. In the district

round Valladolid **wheat** is grown, but not in large enough quantities to supply the needs of Spain; **sheep** are driven from place to place in search of pasturage.

The southern half of the plateau, which lies between the Sierra de Guadarrama and the Sierra Morena, is crossed by the **Tagus** and the **Guadiana.** These rivers have cut deep, narrow and winding channels in the surface of the plateau. They are not only useless for navigation, but they also increase the difficulties of road and railway construction. The two valleys are separated to some extent by the mountains of Toledo.

The provinces of Estremadura and New Castile are almost treeless, scorched by the sun in summer and swept by cold winds in winter. The vegetation is of the drought-resisting kind, such as **esparto grass** (used for paper-making). The few inhabitants of the plateau live in small villages, widely distributed, and they get their living chiefly as shepherds or muleteers. In the south-east of New Castile is the hot plain called **La Mancha** (the scene of Don Quixote's exploits) in which there is hardly any vegetation at all, while the winds in summer and early autumn, blowing across the parched soil, raise clouds of fine dust, through which even the sun appears dull and hazy. Here and there in New Castile are tracts impregnated with salt, which are very similar to the steppes of south-east Russia.

Towns.—**Toledo** was the capital of Spain until the sixteenth century, when Philip II. established Madrid as the centre of government. Built on a rock above the Tagus, the position of Toledo commanded the passage of the river. In the days of its prosperity it was noted for its manufactures of silk goods, woollen fabrics and sword blades; but all these have gone, and a Government factory for small arms now gives employment to a few people.

Madrid was a place of some importance even before it became the capital. It stands on the southern side of the Sierra de Guadarrama, 2,000 feet above sea-level, and is the meeting-point of the roads which cross the passes into northern Spain. Its elevation and distance from the sea give it extreme variations

of temperature (104° to 14° Fahr.). The railways which radiate from Madrid have greatly increased the prosperity of the city. In recent years, new public buildings, fine promenades and residential suburbs have combined to give Madrid a very modern appearance, in striking contrast to old-world cities like Toledo. Beyond the city boundaries the country is bare and desolate. The royal palace, called the **Escorial**, was built by Philip II., and stands 1,500 feet above Madrid.

Badajoz, on the Guadiana, is a fortress near the Portuguese frontier.

Burgos, in Old Castile, commands the roads leading into France; not far from it are the coalfields of the Sierra de la Demanda.

Salamanca, on the Tormes, is an ancient city, and has still a mediaeval appearance. In 1812 Wellington defeated the French near the town.

Between the Cantabrian mountains and the Bay of Biscay is a narrow strip of country which rises abruptly from the coast, and includes the **Basque Provinces, Asturias** and **Galicia**. The climate of this region is **oceanic**, with mild winters, cool summers and rain throughout the year. The westerly winds, heavily laden with moisture, reach the mountains of northern Spain and drench them with rain. This well-watered region presents a striking contrast to the dry, desolate plateau in the interior. Torrents pour down the steep slopes to the Bay of Biscay; forests of oak, beech, ash, and groves of chestnuts, flourish on the mountain sides, while on the lower ground are rich meadows and cultivated fields; maize and fruits grow in abundance.

The coast-line has few harbours, but in Galicia numerous indentations, locally known as **rias**, run into the land; they probably owe their origin to land valleys which have become submerged; in most cases they increase in depth and in width towards the sea. The whole of the coast is dangerous on account of rocks and currents; nevertheless a considerable trade is carried on in small vessels, as communication between the towns on the coast is only possible by sea.

Mining is the chief source of wealth to the inhabitants. The mountains of the Basque Provinces are rich in **iron ore**; large quantities of ore are exported every year from **Bilbao**, to be smelted at Swansea and Middlesbrough. Asturias has an extensive coalfield in the neighbourhood of **Oviedo**—**Gyon** is the nearest seaport.

Galicia, on the other hand, is a mountainous province with no mining industry. Its inhabitants are obliged to rely on fishing, cattle-rearing and agriculture as their chief occupations; they often go to other districts in order to obtain employment as labourers, muleteers or artisans.

Ferrol is one of the most strongly fortified towns in Spain; it has a large arsenal and dockyards, as well as a safe harbour. In the town, linen, cotton and leather are manufactured.

Corunna is a seaport, well known in connection with the death of Sir John Moore in 1809.

Santander is a favourite seaside resort in summer. Cotton, paper, iron foundries and shipbuilding are some of its industries.

San Sebastián, a fortress stormed by Wellington in 1813, now attracts visitors in the summer on account of its beautiful bay.

The Pyrenees, stretching from the Bay of Biscay to the Mediterranean Sea, separate France and Spain, two countries which differ widely in physical features, climate, vegetation and inhabitants. The highest mountains in the Pyrenees are **Maladetta** and **Perdu**. They both exceed 11,000 feet in height and are snow-clad. Railways, connecting France and Spain, pass round the extremities of the range, close to the coast; while no railway has yet been constructed across the range. Road traffic from north to south is only possible at a few places, and at a high elevation; goods are carried chiefly on the backs of mules.

In the central Pyrenees, the valleys on opposite sides of the range are not connected by mountain passes as in the Alps; the end of each valley is blocked by a mountain barrier which, like a wall, stretches from one side to the other. Valleys thus enclosed are called **cirques**; well-known examples of these



Fig. 63.—Pyrenees: the Cirque of Garvanif.

are the Garvanie cirque, on the French side, and the Cotatuero, in the Arrasas valley, on the Spanish side.

The Pyrenees do not possess the variety of **scenery** for which the Alps are famous; the mountains are more regular in outline, and lakes are lacking. There are **glaciers** on the high Pyrenees, but they do not come far enough down the mountain sides to approach the cultivated lands. The drainage from the Pyrenees is small when compared with that of the Alps; the **Garonne** is the only large river which has its source in the Pyrenees; less important rivers are the Adour and Aude on the north side, the Segre, Aragon and other tributaries of the Ebro on the south side.

The western section of the Pyrenees is under the influence of the rain-bearing winds from the Atlantic, and, like the Cantabrian mountains, this part of the range is well wooded with oaks, beeches, etc. Near the Mediterranean, however, the rainfall is scanty, and here the landscape assumes an African rather than a European aspect. On the lower slopes of the mountains grow the olive, vine and cork tree.

Andorra.—High up in the Pyrenees is the little republic of Andorra, occupying an area of 150 square miles (about the same size as the Isle of Wight). The inhabitants chiefly live in the mountain valley drained by the **Valira**, a tributary of the Segre; for centuries they had little or no communication with other people, and even now access to Andorra is very difficult. The people are very quiet and primitive in their habits, while many of their manners and customs are quaint. Agriculture and pasturage are the only occupations.

EXERCISES.

1. Examine the rainfall map of Spain and Portugal (Fig. 35). Account for the distribution of rain (*a*) on the coast regions, (*b*) in the interior.

What is the rainfall of (*a*) Madrid, (*b*) Lisbon?

2. Describe the conditions which decide the climate of (*a*) Madrid, (*b*) Lisbon, (*c*) Bilbao.

3. Explain the terms: Sierras, rias and cirques.

4. Write an account of the races of people who live in the mountainous districts of northern Spain. By what occupations do they get their living, and under what conditions do they live?

LESSON XXXIV.

THE IBERIAN PENINSULA.

1. Write in tabular form the chief seaports of Portugal and of Spain (east and south coasts only). Opposite each seaport write the chief articles exported, and the district from which these articles are brought to the coast.

2. Draw an enlarged map of Portugal, and divide it into natural regions. Print the chief productions of each region.

Catalonia (a corruption of Gothalania), is a very mountainous district in the north-east of Spain; many spurs from the Pyrenees project into the province in a south-westerly direction. Near the coast, however, is a strip of fertile soil stretching from the French border to Tarragona, and in which Mediterranean fruits and wine grow in abundance.

Being a frontier province the **Catalonians** were always open to attack, hence they have developed a military spirit and a love of independence. In many respects they resemble the Provencals, while they differ in every way from the Castilians. They dislike the Castilian government in Madrid, and hence they have become revolutionary; in fact Barcelona is one of the storm-centres of Spain. Nevertheless, the Catalonians are more energetic, intelligent and progressive than any other people in Spain. Industry and commerce are their chief occupations.

Barcelona grew up round the fortress of Montjuich. The town is strongly garrisoned. It is now important as being the chief manufacturing city of Spain. Silk, woollen and cotton goods, lace, firearms, etc., are among the manufactures.

Tarragona is an ancient town with Roman remains, such as an amphitheatre. Silk, jute, felt and lace goods are now made in the town, while in the district fruits and wine are grown.

The Ebro Valley is a wide depression which separates the Pyrenees from the central tableland. It has an undulating surface consisting of poor soil, bare rocks and dry sand; there is little natural vegetation, and trees have to be planted. The River Ebro rises in the Cantabrian mountains, and flows for 450 miles to the Mediterranean. It is of little value for navigation because of shallows, rapids and sandbanks. Boats can reach **Tortosa,** 15 miles from the sea, but part of this course is by canal. The Imperial Canal was constructed by order of Charles V. in order to improve the trade of the valley. This canal extends parallel to the river from **Tudela** to 40 miles below Saragossa. In the Ebro Valley the rainfall is very scanty, as the westerly winds lose their water-vapour on the mountains of the Basque provinces. Cultivation therefore depends almost entirely on **irrigation.** The Aragon and Segre, rising in the Pyrenees, bring a large supply of water from the mountains, and so irrigation is possible near these rivers.

Saragossa (corrupted from Caesarea Augusta) is a very ancient city. It stands on the Ebro, and was formerly the capital of Aragon. In the course of its history it has undergone many sieges and occupations at the hands of the Goths, Moors and French. The inhabitants of Aragon are of a reserved, suspicious and indolent character; they, like the Catalonians, are hostile to the central government at Madrid.

Valencia and Murcia.—Between the eastern edge of the central plateau and the Mediterranean are the two provinces of Valencia and Murcia. The interior of the provinces consists of dry uplands, on which esparto grass grows; lead and copper are mined in the hill ranges.

Along the river-courses, such as the Guadalaviar, Jucar and Segura, vegetation is abundant, and wherever water is found the date-palm flourishes. This is a land of **oases** very similar to northern Africa; **Elche, Murcia, Albacete,** are examples of oases.

During the Moorish occupation, extensive irrigation works were constructed, in consequence of which the cultivated areas became exceedingly productive. To the Spaniards these fertile fields are known as **huertas** (Latin *hortus*, a garden). Oranges, grapes, figs, dates, lemons, olives and mulberries, grow in abundance, as well as crops of maize, wheat and cotton. On

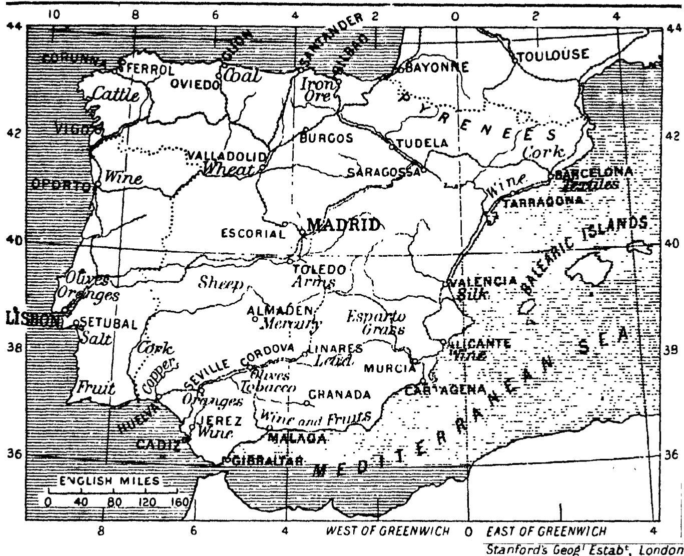


FIG. 64.—THE IBERIAN PENINSULA: SHOWING CHIEF TOWNS, RAILWAYS AND PRODUCTIONS.

the swampy parts of the coast, sugar and rice are grown; **rice** is the staple food of the inhabitants.

The important towns are on the coast.

Valencia, at the mouth of the Guadalaviar, is a small seaport. Silk spinning and weaving are the most important industries.

Alicante is the third port in Spain (after Cadiz and Barcelona). It exports esparto grass, lead, wine and almonds. The warm climate and sheltered position attract invalids.

Cartagena, built by the Carthaginians B.C. 242, is a fortified seaport with a well protected harbour. It has an important naval arsenal.

Andalusia (a corruption of Vandal-usia) stretches from the southern edge (Sierra Morena) of the central plateau to the Mediterranean coast. The surface features are very varied, consisting of the lofty Sierra Nevada and the broad Guadalquivir valley. The **Sierra Nevada,** not more than 20 to 30 miles from the coast, stands out boldly as a sierra, or saw-like ridge, against the cloudless sky, rising to its highest elevation in the snow-capped peaks **Mulhacen** and **Veleta.** These mountains are a little higher than Maladetta in the Pyrenees. Roads, built over the passes in the range, connect Malaga and Motril with the valley of the Jenil.

The coast-strip near Malaga has the warmest winter climate in Europe. Wine is grown largely in this district, as well as sugar, cotton, bananas and oranges; olive groves flourish on the southern slopes of the mountains 1,000 feet above sea-level.

The **Guadalquivir,** or great river (cp. guada with the Arabic wadi = a river), is the only river in Spain that is navigable for any distance from its mouth. In the upper part of its course it is a mountain stream, but below the rapids of Montoro the valley broadens out and the volume of the stream is increased by the waters of the **Jenil,** which come from the snow-clad sierras. Even as far up as Cordova small craft can navigate the river; from Seville to the mouth, a distance of 70 miles, sea-going vessels pass to and fro, as the depth is here increased by tidal water. In this lower course the river makes its way through marshes called **Marismas,** where wild fowl abound. On the wide plains near the mouth of the Guadalquivir are reared horses and herds of cattle, from which bulls are selected for the bull fights. San Lucar is a small port at the mouth of the river, but **Cadiz,** on a good harbour a little further south, is the most important port of Andalusia, and is strongly fortified. The exports are salt, cork, lead, wine and fruits. Cadiz reached the height of its prosperity soon after the discovery of

America, when the products of the New World entered Spain through this port. Near Cadiz is Jerez, the centre of a wine-producing district; the name Jerez has been corrupted into **sherry**.

Huelva is the outlet for the copper mines of the Rio Tinto region.

Seville is not only a place of commercial importance, but it also manufactures tobacco, machinery, pottery and cotton goods. It is also noted for its art treasures; Murillo, Velasquez and other famous painters lived here.

Cordova was a centre of learning during the Moorish occupation. **Granada**, on the Jenil, is noted for its Moorish palaces, such as the Alhambra. The city is beautifully situated in the midst of irrigated fields called **Vegas**, while the lofty Sierra Nevada gives grandeur to the landscape.

The hot climate has made the Andalusians indolent, the bright sunlight has made him gay, light-hearted, and a lover of pleasure (Seville is noted for its bull-fights), and the fertile soil has made him prosperous and contented.

Gibraltar (corrupted from Gebel-el-Tarik = the hill of Tarik) is a rock rising 1,400 feet above sea-level. The Moors held it from the eighth century down to 1502, when it became part of the dominions of Spain. Two hundred years later (1704) it was captured by Admiral Rooke, and ever since it has been under the British flag. Gibraltar is most strongly fortified, and is now important as a naval station and a coaling-port.

Portugal is the western extension of the central plateau of Spain, but the nearness of the Atlantic modifies its climate. The northern half of Portugal is mountainous, and it resembles Galicia both in climate and scenery. The River Douro cuts its way to the sea in a deep valley; on the terraced hill-slopes which overlook the valley are extensive vineyards. **Oporto**, at the mouth of the Douro, gives its name to the **wine** of the district.

In the north, and on the Beira mountains, oak and chestnut trees grow abundantly. Pines have been planted on the coast region in order to bind the sandy soils together; the olive grows in Estremadura.

In the extreme south of Portugal is the very fertile province of **Algarve**; it is bounded on the north by the Serra de Monchique, an extension of the Serra Morena. The valleys on the south side of this range are naturally fertile, but irrigation increases the productiveness of the soil. Oranges, figs, olives, grapes and almonds, are grown everywhere. Some of the inhabitants engage in fishing.

Between the Monchique mountains and the Tagus the land is poor and unproductive; it is thinly inhabited, and is used chiefly as grazing grounds for sheep and goats. This district has more resemblance to the Spanish tableland than any other part of Portugal. Near the Guadiana, however, **cork** trees grow, and the bark is one of the most valuable products of the country. On the coast of Portugal **salt** is obtained by evaporation, especially on the shores of the Bay of Setubal, the lagoon of Aveiro and the estuary of the Tagus.

Lisbon, the capital of Portugal, is beautifully situated at the mouth of the Tagus; the surrounding hills are covered with buildings, plantations and parks. It is the seat of the government, and the chief commercial centre of the country. Factories for cotton, woollen, linen and silk goods have been established recently in Lisbon. **Oporto** is the second city of Portugal; in addition to its wine trade it manufactures woollen and cotton goods, and exports cork, cattle, silk, etc.

Portugal has extensive possessions, *e.g.* Azores, Madeiras, Cape Verde Islands; Angola in West Africa and Mozambique in East Africa.

People.—The inhabitants of the various parts of the Iberian Peninsula differ greatly in language, habits and traits of character. The **Basque** language, spoken by about half-a-million people, who live in the mountains of northern Spain, shows that western Europe at least was inhabited in early times by a race of people quite different from the Celts and Teutons, who now form the bulk of the population. Biscay is a form of the word Basque.

In the fifth century Goths and Vandals overran the country, and a Gothic kingdom was established, having **Toulouse** as its

capital. The word Goth survives in Catalonia, and Vandal in Andalusia. This Gothic kingdom became Christianised, and in the eighth century was conquered by the **Moors** from Africa, who established a Moslem kingdom with Cordova as its capital. The **Christians**, who took refuge in the strongholds of the Pyrenees and the Cantabrian mountains, remained independent, and for centuries they waged incessant war on the Moors.

During the Moorish occupation, **Cordova** became a seat of learning and a centre of commercial activity; irrigation works were constructed to increase the productiveness of the country; many new plants, such as the sugar-cane, were introduced and cultivated; architecture flourished, and examples of it exist to-day in many towns of southern Spain. Many Moorish words still survive, such as Gibraltar, Guadalquivir, etc.

By the twelfth century the Christian kingdoms of **Castile, Leon, Aragon** and **Portugal** were freed from the Moors. The strongholds of the Sierra Nevada were the last refuge of the Moors in their final contest with the Christians. The union of Castile and Aragon, under **Ferdinand** and **Isabella**, led to the expulsion of the Moors from the Peninsula in 1492, the same year in which Columbus, assisted by Ferdinand and Isabella, discovered America. From the accession of Charles V. in 1497 to the present day, Spain has been united under one ruler, having a central government at Toledo or Madrid. During the nineteenth century all the Spanish colonies in the New World threw off their allegiance to the mother country, and in 1898 Cuba was freed from Spanish rule by the United States.

Portugal is the only one of the natural regions of the Peninsula that has acquired importance as a **maritime power.** In the fourteenth century, under the patronage of Prince Henry the Navigator, the Portuguese made important voyages of discovery along the west coast of Africa. In 1497 **Vasco da Gama** discovered the sea-route to India round the Cape of Good Hope, and a little later the coast of Brazil was claimed as Portuguese territory. These discoveries led to the acquisition of many trading positions and colonies. The most important of these

now held by Portugal are situated in Africa and Asia. In 1910 a revolutionary party in Lisbon overthrew the monarchy, and established a republic.

EXERCISES.

1. No towns in Spain and Portugal, except those given below, have 100,000 inhabitants :

CHIEF TOWNS OF SPAIN AND PORTUGAL.

Town.	Population.	Town.	Population.
	1000.		1000.
Madrid,	572	Murcia,	125
Barcelona,	560	Cartagena,	100
Valencia,	213	Saragossa,	106
Seville,	155	Lisbon,	356
Malaga,	133	Oporto,	168

Point out the position of the towns in the table. How is it that nearly all the large towns are on the coast?

During the last hundred years Barcelona has increased in importance, while Cadiz (population 69,000) has declined. Can you account for this?

2. Say what you know of the Spaniards as regards their food, occupations, amusements, and methods of travelling.

3. Examine the railway map, Fig. 64, and compare it with the contour map (Fig. 62). Show that the routes taken by the railways were determined to some extent by the physical features.

Compare the distance from Bilbao to Gijon (*a*) by rail ; (*b*) by sea.

4. Compare the coast strip between the Cantabrian mountains and the Bay of Biscay with the coast strip between the Sierra Nevada and the Mediterranean as regards climate and vegetation.

5. Contrast (*a*) the valleys of the Guadalquivir and the Ebro ; (*b*) Seville and Saragossa.

6. Explain the use of the following terms : huertas, vegas and marismas.

7. Point out the strategic importance of Gibraltar. Compare its importance with that of Malta.

8. Say what you know of Spain as (*a*) a maritime nation ; (*b*) a colonising nation. Describe Portugal in a similar way.

LESSON XXXV.

NORTHERN PLAIN OF ITALY.

1. Examine Figs. 66 and 70.

Find the population per square mile of the following provinces:

AREA AND POPULATION.

Province.	Area in Square Miles.	Population.
		1000.
Piedmont, - - - - -	11,336	3,492
Liguria, - - - - -	2,037	1,211
Lombardy, - - - -	9,297	4,648
Venetia, - - - - -	9,475	3,503
Aemelia, - - - - -	7,990	2,564
Sardinia, - - - -	9,306	869
Sicily, - - - - -	9,935	3,594

Write a list of the above provinces in order of density of population; give the position of each province and its chief town.

2. On a sketch-map of Italy mark the districts most subject to malaria, viz.: the lagoons near Venice; the Maremma marshes; Campagna of Rome; lands round Paestum (south of Naples); the coasts of Apulia, Calabria and Taranto; southern Sicily; and Sardinia.

On the same map mark the towns given in question 5, p. 217. Notice the position of the towns with regard to the malaria districts.

3. Measure the length of the railway journey (*a*) from the Mont Cenis Tunnel to Brindisi, (*b*) from the St. Gothard Tunnel to Genoa.

4. Measure (*a*) the area of the map (Fig. 68) of Venice which is not covered by water, (*b*) the length of the railway across the lagoon.

Italy.—The modern kingdom of Italy consists of parts which may be described as **continental, peninsular** and **insular**

respectively. The continental area lies between the Apennines and the Alps, and is drained by the Rivers Po, Adige, etc. The peninsular part, running in a north-west, south-east direction, terminates in two peninsulas, Apulia and Calabria. The insular portion includes Sicily, Sardinia, Lipari Islands, Elba, etc.

Its central position has always given Italy an important place in the affairs of the Mediterranean. Three hundred years before the Christian era, the whole of Italy had been brought under the sway of **Rome**, and during the centuries which followed the whole of the then known world was gradually conquered. Even after the breaking up of the Roman Empire in the fifth and sixth centuries of the Christian era, Rome, as the residence of the Popes, remained a centre of authority for the Roman Catholic world. In 1870, Italy was once more united under one sovereign, with Rome as its **political** as well as its **ecclesiastical capital.**

Climate.—Italy is protected on the north by the Alps, and it is surrounded on three sides by water. The influence of the Mediterranean tends to equalise the temperature throughout the year, while the Apennines tend to lower the temperature of the peninsula. The Adriatic coast, exposed to north-east winds, is colder than the west coast.

The Po basin is subject at times to cold winds from the snow-clad Alps, and it is shut off by the Apennines from warm south winds. In this basin, then, is experienced the greatest difference between the winter and summer temperature; the winter temperature, however, rarely reaches freezing-point.

As regards rainfall, the peninsula and the islands, like most Mediterranean countries, have most rain in the winter; in the extreme south there are only two seasons, viz. a wet season and a dry season. In northern Italy, however, most rain falls in autumn and spring, while the summer is not deficient in rain.

Natural vegetation depends largely on the configuration of the surface. True Mediterranean vegetation, such as the **myrtle, olive, orange,** and other **evergreens** grow chiefly near the coast and on the lower slopes of the hills; the **palm** in Sicily,

oak and **beech** on the Apennines, the **mulberry** tree in the plain of Lombardy, the **chestnut** on the lower Alps, **birch** and **pine** on the higher Alps.

In centuries gone by many forest districts were cleared, and in consequence of this the water either drained off too quickly, leaving the land too dry for cultivation, or else, overflowing the low-lying lands, it made extensive **marshes.** Under the hot

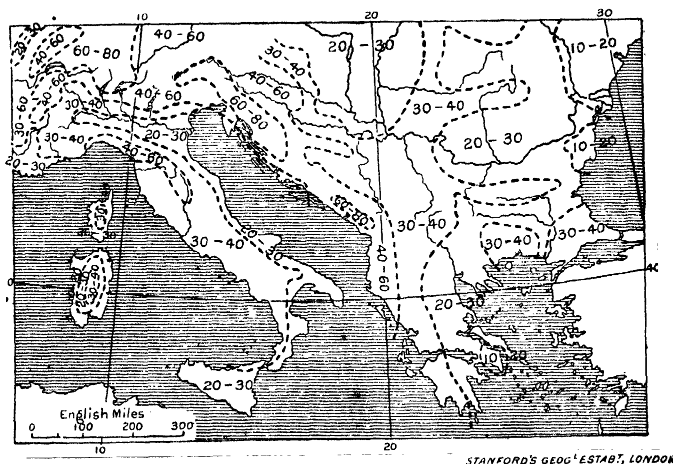


FIG. 65.—SOUTH-EAST EUROPE: ANNUAL RAINFALL.
The numbers denote inches of rain.

Italian sun marshes become very unhealthy in summer, and the people who live near the marshes are subject to malarial fevers; the fevers are caused by the bite of a species of mosquito that breeds in stagnant water. **Malaria** is most common from July to October. Some fertile tracts, such as the Crates valley in Calabria, have remained uncultivated for centuries owing to malaria. Only a few provinces in Italy are entirely free from this scourge; a list of the areas in which the worst forms of malaria prevail is given on p. 201. Attempts are being made to improve the healthiness of these districts

(1) by drainage canals, (2) by planting eucalyptus trees (from Australia).

The Northern plain is bounded on the north and west by the Alps, by the Apennines on the south, and on the east by the Adriatic Sea. Its parts are known as **Piedmont, Lombardy, Venetia** and **Aemilia.** Nearly the whole of this plain is drained by the River Po and its tributaries.

Although the land frontier of Italy passes along the ridges of the Alps, the highest mountains, such as Mont Blanc, Mont Rosa, Mont St. Gothard, etc., lie just beyond the frontier. The highest mountains on the Italian side of the frontier are **Gran Paradiso** and **Mont Viso**, in the latter of which the River Po takes its rise. The Alps slope very steeply towards Italy, and in many of the glaciated valleys are lakes, very deep, wonderfully blue, and surrounded by mountain scenery of exquisite beauty. From the mountain valleys, swift streams, carrying much solid matter in solution or suspension, flow down towards the plains; in the course of ages, especially in times of flood, an alluvial plain has been formed by the deposition of this solid matter. Some sediment is carried onwards to the mouth of the river, where it forms a delta which is constantly increasing in extent.

From the map it will be seen that the general slope of the plain is from west to east; there are also slopes down which the tributaries of the Po from the Alps and the Apennines flow into the main stream; these tributaries nearly all turn east before they join the River Po. The Adige and Brenta enter the sea without joining the Po at all.

The **River Po** rises in Mont Viso, and in the first 21 miles its waters descend 5,000 feet. At Turin it is joined by the **Dora Riparia**, along the valley of which runs the railway from the Mont Cenis tunnel to Turin. A little further east the **Dora Baltea**, which rises in the Mont Blanc range, joins the main stream. From this point in its course the Po has to descend only about 600 feet to reach the Adriatic; its current therefore is very sluggish. Artificial embankments protect the adjacent lands from being flooded; from Cremona to the mouth these

dikes are continuous. The general flatness of the country and the abundance of water in the rivers makes artificial **irrigation** an easy matter. This, together with the high average temperature and the **alluvial soil**, accounts for the productiveness of the region; four, or even six, crops can be often obtained in one year from the same field.

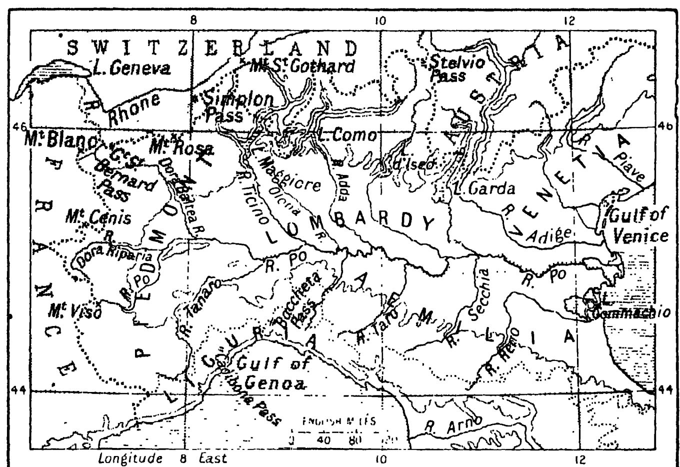


FIG. 66.—THE NORTHERN PLAIN OF ITALY.
The shaded areas are more than 1,200 feet in height.

On the rich **meadow-lands** cattle are pastured, and many kinds of **cheese** are made, such as Gorgonzola, near Milan; Parmesan, near Lodi, etc. **Maize** is cultivated in all parts, **flax** is grown round Cremona, **hemp** near Bologna, and **rice** on the irrigated fields of Lombardy and Piedmont. **Wine** is largely grown throughout Italy; in many districts vines are allowed to twine round trees planted in rows, between which other crops are grown. **Asti**, in Piedmont, and **Chianti** (near Florence) give their names to the best known wines of Italy.

Silk, however, is by far the most valuable product of this

plain; mulberry trees provide food for countless silkworms, and thousands of people are engaged in tending them. Silk-spinning and silk-weaving give employment to about 200,000 people. Milan and Como are the centres of this industry, and silk fabrics are exported. There are also factories in which wool, cotton, flax and hemp are turned into manufactured articles.

Woollen goods are made in Piedmont and Venetia, especially at **Brella**, where water-power is available. Raw **cotton** is imported into Genoa, and manufactured in Lombardy and Piedmont.

Iron ore is mined in some of the Alpine valleys of Lombardy; from the Val Trompia iron ore is taken to Brescia, where it is manufactured into arms and armour. **Salt** is obtained by the evaporation of sea-water from the lagoons near Venice and from the Valli di Commachio—in the latter great quantities of eels are caught every year.

Towns.—In early times the northern plain of Italy was almost uninhabited; dense forests covered the plain, and the swamps extended far beyond the present flood plain, making it a difficult matter to cross the district. The Romans built a road, called the Aemilian Way, from Rimini to Piacenza, sufficiently far from the Apennines to secure a fairly level route, and yet high enough above the river to be safe from flooding. Wherever the Apennine valleys opened out upon the road, towns and villages grew up; among these may be mentioned **Faenza, Bologna, Modena** and **Parma**. One of the most frequented passes of the Apennines lies between the Reno and Arno valleys: the route by this pass joins the road at Bologna, and this fact partly accounts for the importance of Bologna. It will be noticed that the railway to Brindisi follows the course of the old road.

Piacenza was an important Roman station, as here the river could be crossed in safety; at the present time it is a place of strategic importance.

Milan, the chief town of Lombardy, stands on a small river, the Olone, in the centre of the most fertile part of Italy; it has

always been a place of commercial and industrial importance. Its rise to prosperity was due to its position at the intersection of two very old trade routes. One of these ran eastward through Brescia, Verona, Vicenza, etc., and westward through Novara, Vercelli and Ivrea, up the valley of the Dora Baltea to Aosta, and then over the St. Bernard Pass. The other route was from Lake Como to Genoa via Milan.

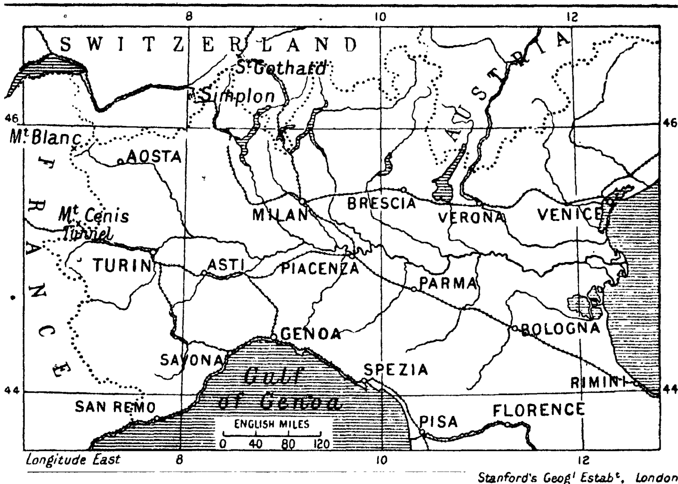


FIG. 67.—NORTHERN ITALY: CHIEF TOWNS AND RAILWAYS.

The opening of the St. Gothard and Simplon tunnels has increased the prosperity of Milan. The two finest buildings are the Cathedral, built of white marble, and the La Scala Opera House.

Turin, the capital of Piedmont, is situated at the junction of the Dora Baltea and the Po. From a strategic point of view the position of Turin is of the greatest importance. It is surrounded by mountains on three sides, and the roads from the passes all concentrate on Turin; in consequence of this it has often been attacked. In the fifteenth century it became the

capital of the house of Savoy—a house to which the present king of Italy belongs.

Verona is now strongly fortified to defend the Brenner route.

Venice owes its origin to the destruction of Aquilea and other Roman trading stations in the middle of the fifth century. The fugitives from these cities took refuge among the sand-dunes and on the islands of the Adriatic coast. They founded the

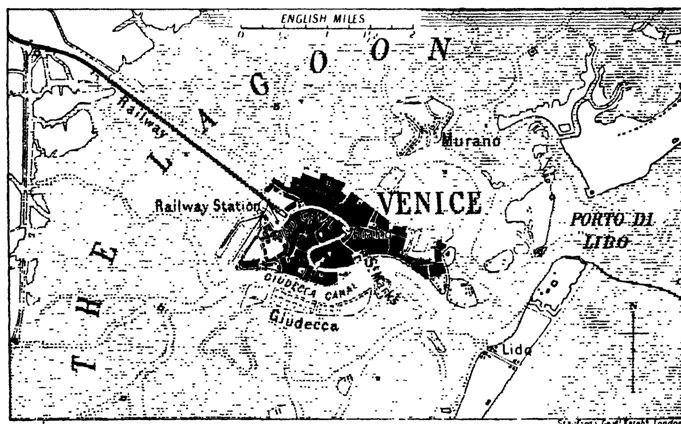


FIG. 68.—VENICE: THE ISLANDS, CANALS AND LAGOON.

city which now spreads over more than one hundred islands and is intersected by canals in every direction. They also began the trade which made Venice pre-eminent among Mediterranean ports to the end of the fifteenth century. The discovery of the sea-route to India ruined the trade of Venice. Among the buildings of note are the Cathedral of St. Mark, the marble bridge of the Rialto, the Doge's Palace, etc. The city is renowned for the beauty of its architecture, its pictures and other works of art.

Ravenna, south of Commachio, is now an inland town six or seven miles from the sea. Its importance lies entirely in the past. During the Roman empire Ravenna was the chief naval

station, and when the empire was breaking up it became the capital in place of Rome.

EXERCISES.

1. Why is the plain of northern Italy suited to the production of raw silk? Mention any processes which the raw silk undergoes before it is turned into the finished article.

2. (*a*) "Cattle from Switzerland are often sent to the plain of Lombardy." Why is this done?

(*b*) "Rice is grown in the Po valley and on the Mediterranean coast lands of Spain, but nowhere else in Europe." What conditions render this possible?

3. Write an account of Milan, Turin and Venice with regard to position, health conditions and trade.

Why do tourists visit Venice rather than Turin?

4. Write out a list of the mountain passes shown on the map (Fig. 66); describe the commercial importance of each pass.

5. The production of cereals in Italy for one year is given below:

Cereal.	Area Cultivated.	Produce.
	1000 acres.	1000 bushels.
Wheat, - - - - - -	12,256	158,181
Maize, - - - - - -	4,116	88,065
Rice, - - - - - -	366	19,265

Find the number of bushels per acre for each cereal. Under what conditions are these cereals grown?

6. Compare Figs. 66 and 67. Point out the relation of the towns on Fig. 67 to the physical features shown on Fig. 66, especially with regard to lines of communication.

7. Describe Fig. 67. Make some reference to the railways shown on the map.

LESSON XXXVI.

THE ITALIAN PENINSULA.

1. Draw a large sketch-map of the rivers Tiber and Arno, and of the land which lies between them. Enter on the map any features which are mentioned in the following description. Mark clearly the railway from Rome to Florence.

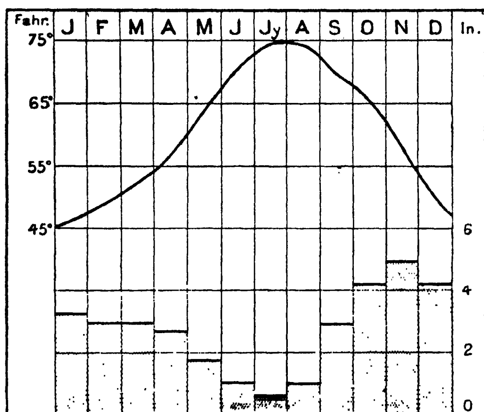


FIG. 69.—NAPLES: TEMPERATURE AND RAINFALL.

2. Examine Fig. 69. In the diagram the curve shows the variation in temperature; the vertical columns show the rainfall for each month.

(*a*) In what months is the temperature highest at Naples? in what months lowest? What is the range of temperature?

(*b*) In what month does most rain usually fall? in what month is the least rainfall?

(*c*) Find the number of inches of rain which fell in the year.

(*d*) Point out from the diagram any characteristics of the Mediterranean type of climate.

The Apennines are said to be separated from the Alps by a pass, the Collo di Cadibona, 1,600 feet high, over which

a railway passes from Savona to Turin. East of this pass the Apennines rise abruptly from the waters of the Gulf of Genoa, but on the northern side they slope gently towards the River Po. Leaving the Gulf of Genoa, the Apennines stretch across the country towards the Adriatic; in this part of the range are rugged limestone peaks, while on the lower slopes which face the south are **olive groves** and **vineyards.** Two railways cross this section of the Apennines, one connecting Bologna and Florence via Bracchia, the other over the Scaletta Pass, connecting Spoleto and Ancona.

Further south, the Apennines divide into an irregular series of mountains, clothed to some extent with oaks and beeches, until they terminate in Calabria in the south-west under the name Aspromonte (= rugged mountain). The highest mountain in the Apennines is **Gran Sasso** (= great rock).

Liguria.—The strip of land bordering the Gulf of Genoa is known as the Italian Riviera; **San Remo, Genoa, Spezia** and other towns on the coast are so sheltered by the mountains that they enjoy a climate equal to that of Naples, and they are surrounded by vegetation similar to that of southern Italy. A railway runs along the coast through tunnels and close to the sea, while three railways connect this shore-line with the plains beyond the mountains.

Genoa, the leading port of Italy, stands on a good harbour. In the Middle Ages Genoa was the rival of Venice; it was the natural outlet for the products of Piedmont and Lombardy, over the Boccheta and Giovi passes. Turin is only 65 miles from Genoa, Milan 75 miles. The opening of Alpine tunnels and the Suez Canal has increased the trade of Genoa. Steel ships, torpedo boats and locomotives are built at this port.

Savona is a thriving port west of Genoa.

Spezia is the chief naval port of Italy. It has a spacious harbour, with defensive works and arsenals. Communication with the interior is difficult, and so Spezia has never become a mercantile port.

Carrara, east of Spezia, is noted for its **marble** quarries, from some of which the best marble for statues is obtained.

Between the Apennines and the west coast the land is crossed by the Arno, Tiber and Volturna; these rivers flow at first in longitudinal valleys, and then cross the plains to the sea. The Arno and Tiber rise near each other, but their mouths are far apart; the coast-line between their mouths is deficient in good harbours, and an unhealthy tract of marshy land, called **Maremma,** stretches from Cecina to Orbetello.

Leghorn has taken the place of Pisa as a port, in consequence of the silting-up of the Arno. For a similar reason, Civita Vecchia is the nearest seaport to Rome. The valley of the Arno is thickly inhabited; the olive, vines and fruits grow in abundance.

Lucca is noted for the quality of its **olive oil,** as well as for its mineral springs, and **Chianti** for the excellence of its wine.

Florence, situated on the Arno, became in the Middle Ages a well-known seat of learning; the city was noted for poets, sculptors, painters and historians, and it now attracts visitors and students to its art-galleries and its libraries. Fine buildings adorn the city. Silk-weaving, straw-plaiting and mosaic work are among the modern industries of Florence.

Pisa, no longer a port, possesses architectural monuments, such as the Cathedral, Leaning Tower, etc.

South of the Arno is a district in Tuscany in which jets of steam and hot vapours containing boracic acid rise from the ground—these occur near Grosseto, Cornate, etc.; in the same district are many extinct volcanoes, of which Mount **Amiata** is higher than Vesuvius. Lakes now lie in the craters of some of these old volcanoes, *e.g.* Lake de Vico.

Between the Tuscan hills and the Apennines are depressions, from which the water could not find an outlet to the sea. Shallow lakes were therefore formed, such as Trasimene; these lakes have now been drained wholly or partially.

The Campagna di Roma is an undulating district, in the centre of which Rome is situated. The Campagna is bare, treeless and sun-scorched. In ancient times, although somewhat unhealthy, it was cultivated, but in the Middle Ages the Campagna was devastated by the Goths, Lombards and others, while

inundations of the Tiber helped to complete its ruin. It is now chiefly used as pasture-land for sheep and goats. The Campagna abounds in objects of historical interest; fragments of ancient buildings are met with everywhere.

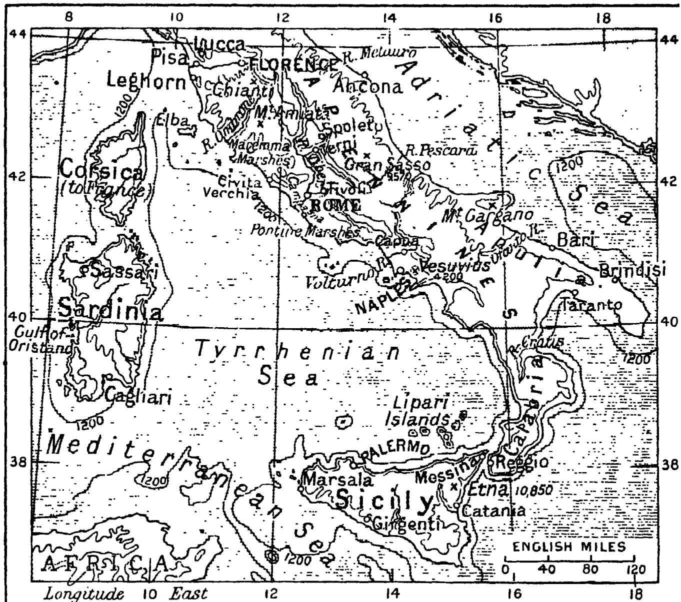


FIG. 70.—SOUTHERN ITALY.
Contour of height is 600 feet.

Rome, the capital of Italy, is situated on the Tiber. In ancient times the Tiber must have been navigable for small sea-going vessels as far as Rome. The seven hills, on which Rome was built, provided a good position for defence, and a position safe from the frequent inundations of the Tiber; it was also a good centre of communication. The magnificence of ancient Rome is shown to some extent by the remains of buildings, such as the triumphal arch of Severus, the Coliseum, etc.

The most notable buildings to-day are St. Peter's, the largest cathedral in the world, and the Vatican, the residence of the Popes. Since 1870 great attempts have been made to modernise the city.

Twenty miles from Rome is **Tivoli**, beautifully situated on the slopes of the Sabine Hills, down which the River Amiene comes in a magnificent waterfall. This water-power is used to generate the electricity for the lighting of Rome. Tivoli is a charming place of residence.

Terni is on the Velino, a tributary of the Tiber, near the celebrated Cascade delle Marmore (= marble falls). Iron and steel works have been established at Terni, because water-power is available.

Near Terracina are the **Pontine Marshes**, a district almost uninhabited because of malaria.

Campania.—The plain crossed by the Volturno is exceedingly fertile, and it has always supported a large agricultural population; the vine, olive, almonds and figs, all grow in abundance. On the coast of Campania are good harbours; Naples, Salerno and Gaeta are commercial ports. South of Salerno the country is too unhealthy for habitation. The volcanic district near Naples is an active one. **Vesuvius** has had many violent eruptions since the first recorded outburst in 79 A.D., in which Herculaneum and Pompeii were destroyed. In the neighbourhood sulphurous vapours and carbonic acid gas are emitted from fissures. Lake Auvernus, half-a-mile in diameter, lies in an old crater.

Naples, the most populous city of Italy, is beautifully situated on the bay, not far from Mount Vesuvius. The hills which surround the bay are clothed with vegetation of almost tropical splendour—cactus, agave, orange, lemon, palm and vine.

Pozzuoli lies west of Naples; it possesses a government factory for the manufacture of arms, armour-plates and naval machinery.

Capua, on the Volturno, is a fortified town in the centre of an agricultural district.

Calabria is a mountainous peninsula with very unhealthy coasts. The town of Reggio overlooks the Strait of Messina.

The Adriatic border lands.—Between the Apennines and the Adriatic Sea the land is crossed by numerous rivers, which flow, as a rule, at right angles to the direction of the mountains; among these are the Metauro, Pescara, Ofanto, etc.

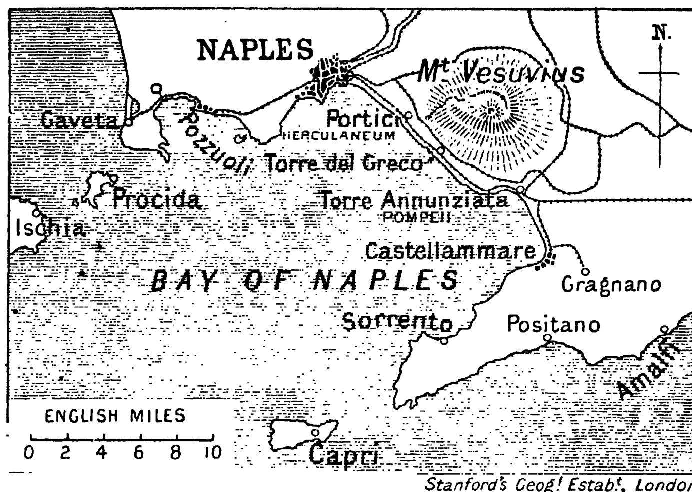


FIG. 71.—THE BAY OF NAPLES.

This country is uniform in character—the hills are covered with vines, and the small towns of the interior are markets for the agricultural products of the district. **Wool** and **wheat** are the two chief productions of Apulia, the wheat being specially adapted for making maccaroni.

The coast-line is singularly deficient in good harbours; from Venice to Brindisi, **Ancona** is the only port, and its trade is small.

Brindisi has a large well-sheltered harbour. In Roman times it was the starting-point for Greece; at the present day it is the terminus for the Overland Route, and steamers carry mails and passengers to and from the Suez Canal.

Bari, the largest town on this part of the coast, is a small manufacturing town; it has a roadstead, but no harbour.

The rivers which enter the Gulf of Taranto have deposited so much sediment that they have pushed the coast-line seawards; these deltaic deposits have increased the unhealthiness of the coast region. **Taranto** has a fine harbour, the inner part of which is used as a naval basin, the outer part for merchant ships. A government **arsenal** has been established. In consequence of these developments the town has increased in population, although malaria is prevalent in the district.

San Marino is a small republic; it is entirely surrounded by Italian territory, but it is free to manage its own affairs. The city stands on a rock 2,400 feet high.

EXERCISES.

1. The following articles were imported into the United Kingdom from Italy in one year:

BRITISH IMPORTS FROM ITALY.

Articles.	Value £1000.	Articles.	Value £1000.
Cheese,	263	Olive Oil,	130
Eggs,	443	Wine,	48
Fruit (Oranges, Lemons, Almonds, etc.),	593	Silk (Thrown),	202
Stone (Hewn),	194	Silk (Manufactured),	850
Hemp,	388	Plaited Straw,	95
Hides (Raw),	474	Poultry and Game,	105

Which of these articles were obtained from southern, central and northern Italy respectively? By what routes were these articles probably brought to the United Kingdom?

2. Examine the rainfall map (Fig. 65). Account for the difference in rainfall on the east and west costs of the peninsula of Italy.

3. Describe the map of the Naples district (Fig. 71). What is the position of Naples with regard to Vesuvius?

4. On which side of the Apennines does the olive grow best? What uses are made of the fruit of the olive tree? What town is noted for its trade in olives?

5. The following twelve towns in Italy have more than 100,000 inhabitants :

CHIEF TOWNS OF ITALY.

Town.	Population 1000.	Town.	Population 1000.
Rome, - - -	575	Florence, - - -	227
Naples, - - -	596	Bologna, - - -	165
Milan, - - -	584	Venice, - - -	160
Turin, - - -	371	Messina, - - -	150
Palermo, - - -	319	Catania, - - -	163
Genoa, - - -	275	Leghorn, - - -	108

Describe the position of each town, and mention any fact which helps to explain why it is a great centre of population.

LESSON XXXVII.

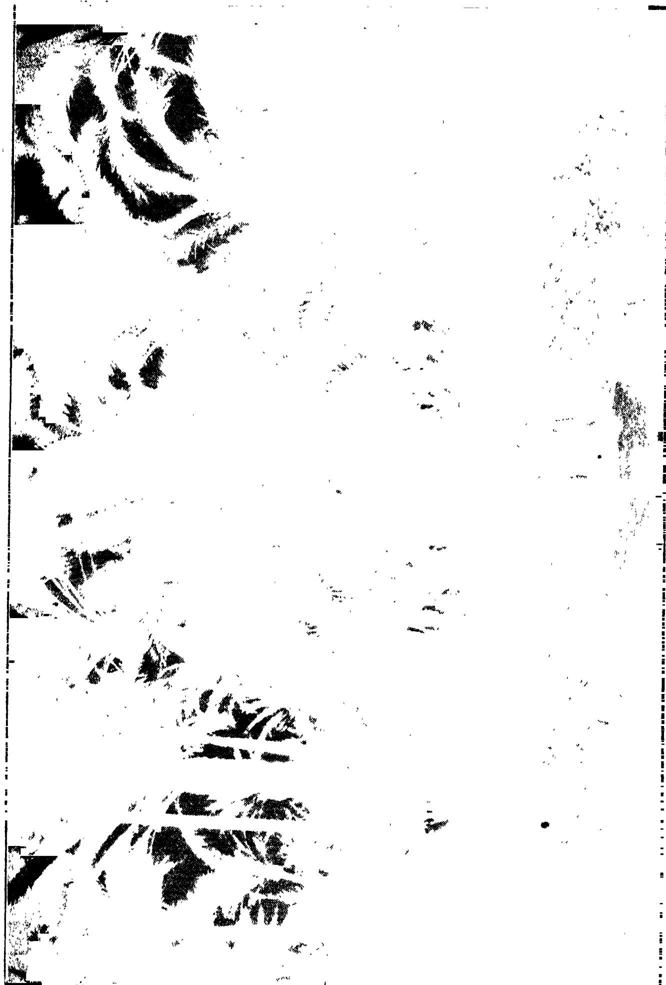
SICILY AND SARDINIA.

1. Draw a map of Sicily. Mark on it the towns and productions mentioned in the following description. Shade in the districts where most people live.

Measure (*a*) the greatest length of the island, (*b*) its area, (*c*) the extent of its coast-line. Find similar measurements for Sardinia in order to compare the two islands.

2. Assuming that Mount Etna is 10,000 feet high, and that clouds of steam during an eruption reach a height of 500 feet, at what distance from the mountain would these clouds be seen? On a map draw a circle with this distance as radius to show the area over which the eruption would be visible.

(To find the distance required, draw a circle to represent the earth. Through a point B on the circumference produce a diameter to a point D, so that BD represents the height of the flames above sea-level. From the point D draw a tangent DH; this will be the distance required. The distance of H from the mountain will be found approximately by multiplying the length of the earth's diameter by the height BD (in miles), and then taking the square root.)



The Photochrom Co.

Fig. 72.—A Garden near Palermo.

Sicily is the largest island in the Mediterranean. It is very mountainous everywhere except in the east, where a fertile plain reaches the coast near Catania. From this plain rises **Mount Etna** to a height of over 10,000 feet; the slopes of the mountain consist of lavas and other volcanic materials. Not far from the north coast the mountains form a definite range, having the steeper slope on the northern side.

Forests of oaks, beeches, chestnuts, etc., once covered the hills in the interior; they have nearly all been cut down, and so the country is left dry, scorched by the sun, and in some parts sterile. The climate of Sicily is warm and equable, especially on the north and east coasts; on these coasts oranges grow in abundance; wine is largely grown in the west in the **Marsala** district, while palms, figs, lemons and almonds flourish in many parts of the island. Wheat has been cultivated ever since Roman times. **Caltanisetta** and **Girgenti** are noted for their deposits of sulphur and rock-salt. **Messina** is situated on the deep narrow strait opposite Reggio, and it has good accommodation for ships. The town was nearly destroyed by an earthquake in 1908.

Palermo, a city founded by the Phoenicians, stands on a fine harbour. It is surrounded by vineyards and fruit plantations. The district is almost free from malaria, and is one of the most densely populated parts of the island.

The **Lipari Islands** are all of volcanic origin. They are all extinct except **Stromboli** and **Vulcano**, which are frequently in eruption. The largest island, **Lipari**, is made of lava and scoriae, and pumice-stone is an article of commerce.

Sardinia is separated from Corsica by the Strait of Bonifacio seven and a half miles wide. A large part of the island consists of mountains of hard rocks, such as granite, gneiss, etc.; these mountains are partially covered with forests of oak, cork and other trees. In the south-west of the island is a broad alluvial plain, called **Campidano**, stretching from Cagliari to the Gulf of Oristano. Wheat has been grown on this plain for centuries, although the yield now is only about ten bushels per acre. The vine and olive are also cultivated.

Mineral wealth abounds in the southern part of the island. **Iglesias** is the chief mining centre, and zinc, lead and silver, the chief products. The climate is very unhealthy; even in summer dense mists hang over the marshes and lagoons.

Round the coast of Sardinia there are fisheries—tunny and anchovy.

Cagliari, the capital, stands on the best harbour in the island; **Sassari** is in the north. These towns are of local importance only.

Elba is six miles from the mainland. The chief industry is iron mining, but there are quarries of granite and marble. Napoleon was exiled here in 1814-15.

Malta.—The Maltese islands, Malta, Gozo, and Comino, belong geographically to Italy, but politically to Great Britain. Valetta, the capital of Malta, has a good harbour, and is one of the most important ports of call for ships passing through the Mediterranean. Malta is also the headquarters of the British fleet in the Mediterranean.

The People of Italy.—During the past centuries Italy has been frequently invaded; under various pretexts Spain, France, and Austria sent armies which not only devastated the land but subjected the inhabitants to tyranny and ruinous exactions. The country was divided into many states, in which the rulers were often changed through invasion or revolution. This unsettled state tended to produce a lawless spirit among the people, and perhaps helps to account for the prevalence of brigandage and for the secret societies which still exist in some parts of the country, such as the Camorra of Naples and the Mafia of Sicily. Although Italy was united under one sovereign in 1870, some of the evils of earlier times still remain.

The physical features of Italy have also had an important influence on the inhabitants as regards habits and occupations. On the fertile plains of the north the people have become successful agriculturists. They are well distributed over the plain, and in comparison with the size and productiveness of the region large towns are not numerous. Much of the land is owned by non-resident proprietors, who let it out to small tenant-farmers. After paying all the charges on his farm the

tenant has little profit for himself, hence the farm-labourers are miserably paid, and every year many of them emigrate to America. Skilled artisans also receive poor wages, and consequently many of them seek work in other countries. They are often employed on great engineering works, such as railway construction, dock improvements, etc. The Italian workman is as a rule sober, thrifty and skilful; his food consists chiefly of maize, maccaroni and fruit, meat being rarely eaten.

The Apennines act as a barrier between the inhabitants of the Po basin and the people of the peninsula; on the mountains few people can get a living, as even minerals are scarce.

In southern Italy and on the islands, arable land is restricted to certain areas, while malaria makes some districts uninhabitable, consequently the population becomes more centralised than it is in the north. Rome, Naples, Florence and Palermo are examples of centres of great population. It is to be noted, however, that in this part of the country many agriculturists, though living in the towns, go backwards and forwards to their farms, hence this part of the population of the towns is rural rather than urban.

The Italian, like all natives of southern Europe, is hot-blooded, passionate and quick to resent an injury. When he lived under a weak Government he had to avenge his own wrongs, and now under a more stable form of Government it is difficult for him to give up a custom that has become almost a habit with him. Hence personal assaults and attacks with the stiletto are common.

The sunny climate makes the Italian indolent, light-hearted and gay; he loves pleasure and delights in music. The lower classes are illiterate and superstitious; many of them, especially in Naples, have no permanent dwellings, but they spend their lives in the open air, and often prefer begging to honest work.

EXERCISES.

1. What volcanoes are situated in the kingdom of Italy? What shape have many volcanoes? How do they get this shape? Draw a sketch of an imaginary volcano. What is meant by crater, lava

and scoriae? What is an extinct volcano? an active volcano? Are there any volcanoes in any other part of Europe? If so, give examples, and say whether they are active or extinct.

2. Describe the conditions under which an agricultural farmer lives in Italy. Why do so many Italians emigrate every year? To what parts of the world do Italian emigrants chiefly go?

3. In what respects does Sicily resemble northern Africa?

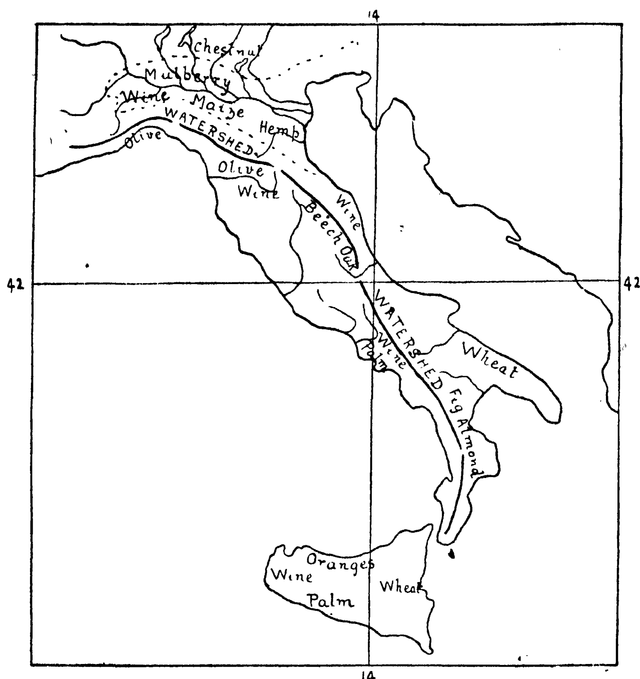


FIG. 73.—Sketch map to illustrate question 4.

4. Draw a sketch map of Italy and Sicily, and mark on it clearly (*a*) the chief watershed of the peninsula, (*b*) the limits of the Northern Plain, (*c*) the distribution of vegetation, (*d*) one line of longitude and one line of latitude.

LESSON XXXVIII.

THE BALKAN PENINSULA.

1. On a map of the Balkan Peninsula shade in different colours the areas that have

(*a*) Mediterranean type of climate;

(*b*) continental type of climate.

Enter on the map the vegetation that belongs to each area, and the period of the year in which most rain falls.

Mark also the steppe-lands.

2. Draw sections along the following lines:

(*a*) longitude 26° E.

(*b*) latitude 42° N.

3. Find the height above sea-level of the following places: Adrianople, Sofia, Philippopolis and Cetinje.

4. On an outline map of the Balkan Peninsula draw the courses of the chief rivers, and enclose the river-basins with dotted lines.

Measure the area of the Maritza basin.

The Balkan Peninsula.—The distribution of mountains in the Balkan peninsula is the most important factor

(*a*) in deciding the lines of communication;

(*b*) in accounting for the variations of climate in the different districts;

(*c*) in explaining the positions of the chief towns;

(*d*) in tracing the political development of the various states.

Nearly the whole of the peninsula is mountainous, and yet there are few distinct ranges; with the exception of the Balkans, Rhodope Mountains, Pindus and Dinaric Alps, mountains appear as irregular masses scattered over the country. Most of the rivers are mountain streams, and are unnavigable, while the Vardar, Mesta, and others are forming deltas and silting up their mouths. Hence the mountains of this country are obstacles to communication, and the rivers do little to assist it.

The **Balkans** seem to be a continuation of the Carpathians, running at first southwards in Servia, and then turning in an easterly direction to the Black Sea. Sloping gradually to the Danube on the north, they give rise to many rivers which flow across the Bulgarian plain, while, towards the south, the slopes are very steep. The whole range is well wooded with forests

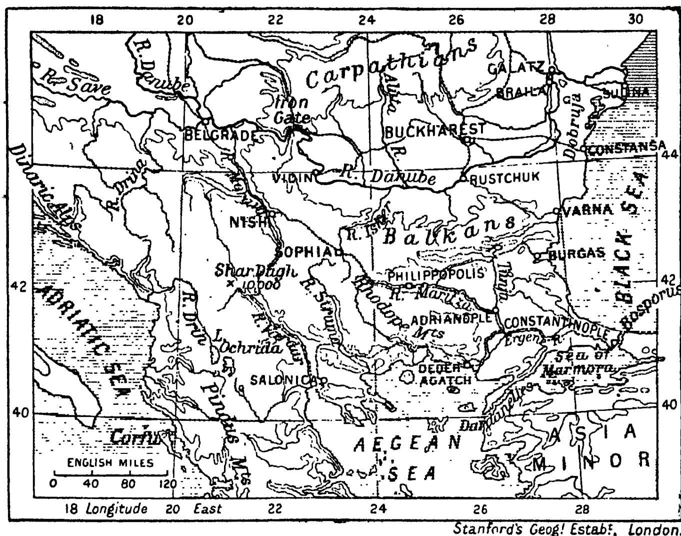


FIG. 74.—THE BALKAN PENINSULA.
Contour of height 1200 feet.

of **oak, beech** and **fir.** Many passes provide easy routes across the range; the best known being the **Shipka Pass,** strongly defended by the Turks against Russian invasion in 1878.

The **Rhodope** mountains are also well wooded, but jagged peaks and bare ridges stand out above the forests; the sides of the mountains are in places precipitous, the passes are high, and bridle-paths are the only tracks across them. Between the Balkans and the Rhodope mountains is the **Maritza** Valley, noted for its cultivated fields, but after the junction of the

Tunja, the Maritza turns southwards and crosses a country very similar to the grassy steppes of Asia.

The Maritza and Morava valleys are separated by the mountains which encircle the **Sophia basin.** The **great road** (and now the railway) from Belgrade to Constantinople traverses the valleys of the Morava and Nishava, crosses the mountains at an elevation of 3,000 feet, and then passes along the valleys of the Maritza and Ergene to Constantinople. From Sophia, roads also branch off northwards into Bulgaria, and southwards to the Struma and Vardar valleys. A railway runs from Belgrade to Salonica along a natural highway formed by the valleys of the Morava and Vardar ; both valleys are narrow and shut in by mountains, which make east and west communication very difficult.

The Dinaric Alps form a series of parallel ranges ; the chief formation is **limestone**, in which occur caves and subterranean channels. Throughout the western part of the Balkan peninsula, especially in Albania and Montenegro, the country is full of mountains. Plateaux and valleys do occur, but they are so hemmed in that it is difficult to pass from one to the other ; in some of the depressions among the mountains are lakes, such as Ochrida, Prespa, etc. All the paths which connect the Adriatic coast with the interior are steep and difficult ; the most frequented routes are along the valleys of the **Narenta** (into Bosnia), the **Drin** and the **Skhumbi** ; the last road is an old military road built by the Romans, and it passes round Lake Ochrida to Salonica ; from Salonica a road crosses the flat coast-lands to Constantinople.

Climate.—The lands which lie on the shores of the Adriatic and Ionian Seas conform to the **Mediterranean type** of climate ; there is no great difference between the summer and winter temperatures ; the summers are dry, and rain usually falls in the late autumn and winter. The vegetation of this coast strip is of the luxuriant Mediterranean type, namely evergreens, olives, figs, oranges and lemons.

The general elevation of the interior and the distribution of the mountains modify the Mediterranean conditions of climate.

The Balkans run east and west, and they leave the plains of the lower Danube and Maritza valleys exposed to easterly and north-easterly winds of winter and early spring. The lands bordering the Black Sea receive little rain, and so the Dobruja and the Adrianople plains resemble steppe-lands.

The mountainous regions in the interior have climates **continental** in character; the difference between winter and summer temperatures is very great. Rain falls throughout the year, but most rain falls in summer, June being the wettest month in many mountain districts; more snow falls on these highlands than in any other part of the Mediterranean region. In Bosnia snow falls sometimes in the middle of May, while the summer rainfall increases from the coast towards the interior. On the interior highlands, Mediterranean vegetation gives way to forests of oak, beech, pine and the fruit trees of Central Europe.

The flat lands west of Salonica and the low-lying parts of Greece are infested with malaria due to swamps and lack of drainage canals.

EXERCISES.

1. Examine the rainfall-map (Fig. 65). Account for the distribution of rain in the Balkan Peninsula (*a*) on the west coast, (*b*) east coast, (*c*) interior.

2. From Fig. 74 describe the route taken by the railway from Belgrade to Constantinople.

LESSON XXXIX.

TURKEY AND GREECE.

1. Describe Fig. 75. Measure (*a*) the width of the Golden Horn, where the bridges cross; (*b*) the width of the Bosporus from Dolma Bagtche to Scutari.

2. Draw a large map of Turkey—shade in the area which is under Turkish rule at the present time. Mark three seaports

and two inland towns, and show the most convenient route from the inland towns to the coast.

Turkey is separated from Asia Minor by the Bosporus, Sea of Marmora and the Dardanelles. The **Bosporus** (= ox-ford) is nearly 20 miles long and only 3 miles across at its widest

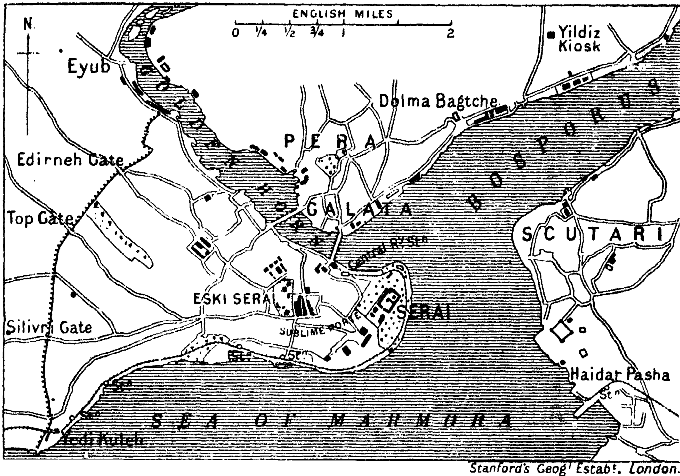


FIG. 75.—CONSTANTINOPLE AND THE GOLDEN HORN.

part; the shores are bold, rocky and partly covered with evergreens. Many fine residences overlook the strait. Near the southern end of the Bosporus is a winding inlet, called the **Golden Horn,** on which **Constantinople** is situated. Constantine the Great founded the city (A.D. 330) on the site of Byzantium, an old Greek trading place. Since the fifteenth century it has been the capital of the Turkish dominions, and it is known to the Turks as Stamboul. The cathedral of St. Sophia is now used as a mosque. Foreigners live on the other side of the Golden Horn; **Galata** being the merchants' quarter, and **Pera,** a hilly suburb, where the embassies and consulates are situated.

The **Sea of Marmora** has a steep coast, and is deficient in good harbours. Rodosto is a small port. The **Dardanelles** is much longer and wider than the Bosporus—its banks also are lower and less picturesque than those of the Bosporus. **Gallipoli** is a fortified town with a little trade.

Adrianople, on the navigable Maritza, is the most important military town of European Turkey. The steppe-lands near Adrianople are treeless, but grass and coarse shrubs do grow; in summer they are sun-scorched and swept by dust storms. The few inhabitants are engaged in sheep, cattle and horse farming—wool is the chief production, and is manufactured into carpets at Adrianople.

The alluvial soils of the Maritza and Ergene valleys are well cultivated—wheat, maize, tobacco and wine being the chief crops. **Dede Agach** is the chief port of the Maritza valley, and it has a small grain export.

Macedonia. Some parts of Macedonia are fertile, especially in the low basins around Drama, Seres, Monastir and near Salonica; cereals, tobacco and olives are grown, but agriculture is in a very backward condition. **Salonica**, the capital of Macedonia, has increased its trade greatly since the railway to Belgrade was built. Most of the inhabitants are Jews, who trade in silk, cotton, tobacco, wool and carpets. Leather is made at **Monastir** (Bitolia). **Skopia**, on the Vardar, is important as the point where the road from Salonica sends out branches into Servia, Bosnia and Montenegro.

Albania is a highland region of bare, rugged mountains; the only fertile soil is on the Adriatic coast, and this is often too unhealthy for cultivation. Sheep-farming is the chief occupation, and olives grow on some of the hill slopes. **Scutari**, on the Drin, is the chief town.

Races of people.—The **Turks** entered Europe in the fifteenth century, and for the next two centuries their conquests made them masters of all the lands in the Balkan peninsula (except Montenegro) and some states beyond the Danube. Since that time the Turks have been the **dominant** race, but they have always been outnumbered by the other races. They

never assimilated the peoples whom they conquered—this was due not only to the difference in race, but also to the difference in religion. Some of the subdued peoples became Mohammedans, but many neither changed their religion nor their language, and these, in recent times, have asserted their right to national independence.

The Turks have always been noted for their warlike qualities—even to-day the Turkish soldier is a good fighting-man, although he is often badly paid and ill-cared for. The Turkish peasant is sober, honest and long-suffering. As a ruling class the Turks have failed conspicuously—their Government has been noted for its corruption, every province has been taxed to the point of ruin and progress has been impossible. Christians have suffered the severest oppression at the hands of Turkish governors. These and other causes have brought about the disruption of the Turkish empire; during the nineteenth century Greece, Servia and Roumania gained their independence, while Bulgaria and Rumelia are practically free.

The foreign trade of Turkey is almost entirely in the hands of English, French and Belgian merchants.

Among the races which are still under Turkish rule may be mentioned Albanians and Macedonians.

The **Albanians** are real **mountaineers**, whose wealth consists in sheep and goats. Living as they do in isolated mountain valleys they are divided into numerous warlike tribes, between which vindictive **feuds** seem to be a rooted institution. Most of the Albanians have adopted Mohammedanism, while the rest belong either to the Greek Catholic or the Roman Catholic church. The tribal quarrels and the differences in religion account for the fact that Albanians have never developed a national spirit, and so they have not gained their freedom from Turkish rule.

The majority of the people living in Macedonia closely resemble the Bulgarians in habits and social customs, but the Servians also claim them as kinsmen. The **Macedonians** mostly belong to the Greek Church.

Crete is a large island lying to the south of the Aegean

archipelago. The north coast of the island is indented, and is bordered by a strip of fertile land, but the south side has no harbours. The **climate** of Crete is warm and equable; about 27 inches of rain fall every year, but in summer the rivers frequently dry up. Grain, olive oil, wine and fruits are the chief productions, but cattle and sheep are kept in the interior. **Canea** is the capital, but Suda Bay has the best anchorage.

The **Cretans** have been notorious from early times as mendacious, turbulent and impatient of restraint. From 1669-1898 the Turks ruled the island, and nearly ruined it. Most of the people are Greeks, and **religious feuds** between the Mohammedans and Christians were frequent. In consequence of these internal dissensions the four powers—England, Russia, France and Italy—placed the island under a Commissioner nominated by the King of Greece; the suzerainty of Turkey is still acknowledged, but in name only.

Greece.—The kingdom of Greece comprises the most southerly part of the Balkan peninsula, together with the Ionian Islands off the west coast and hundreds of islands in the Aegean Sea. The mainland is very mountainous, and only 18 per cent. of the country can be cultivated. There are few permanent streams and artificial irrigation is necessary in many districts. As a rule the summers are hot and dry and the winters warm and rainy. On the west coast the rainfall is much heavier than on the east.

In **Morea** grow the palm, orange, olive, fig and vine; near the west coast of Morea **currants** grow on the low hills up to an elevation of 1,000 feet. The currant (a corruption of the word Corinth) is a small seedless grape, and is the chief article of export, **Patras** being the shipping port. Cotton and tobacco are grown in the district round Livadia, while wheat and maize grow in Thessaly. Sheep and goats find pasturage on the hill-slopes.

Greece is not important as a mineral-producing country—the chief mineral found is silver-lead at Laurium in East Attica.

The absence of coal, lack of water-power, and want of capital prevent the development of industries.

People.—In very early times the Greek states reached a very high standard of civilisation; the plains, on which the cities grew up, were separated by mountains, and so Greece became a land of independent cities, *e.g.* Athens, Sparta and Thebes. Because of their isolation the citizens developed a **military spirit**, a **love of liberty**, and **patriotism**. The broken coast-line and the physical conditions of the country made the ancient Greeks take to the sea as **traders** and **colonists**. Many important towns, such as Marseilles, Byzantium (Constantinople), Odessa, etc., owe their origin to Greek settlements. Soon after the capture of Constantinople by the Turks in 1453, Greece was conquered by them, and during the four hundred years which followed, the tyrannous rule of the Turks almost ruined the country. Many Greeks sought refuge in the mountains, leaving the lands uncultivated and uncared for; some took to piracy.

At the beginning of the nineteenth century a struggle for freedom took place (1821-9), in consequence of which Greece became an **independent** kingdom.

The Greeks of to-day are of mixed blood, and they speak a language which is a corrupt form of ancient Greek. They are, however, well educated and much more highly **cultured** than any other Balkan race. Like the Greeks of ancient times many of them turn to the sea for a living as sailors or merchants. A great deal of the **carrying trade** of the Mediterranean and the Black Sea is confined to ships flying the Greek flag. Greek merchants have business houses in London, Liverpool, Hamburg, and other ports of Western Europe. They trade chiefly in currants, wine, oil, tobacco, figs and sponges.

Athens, the capital, is noted for its historical associations; the remains of ancient buildings stand on the Acropolis.

Piraeus, the port of Athens, has again become a prosperous town.

Corinth, on the isthmus, was once a city of great importance, now it is a mere village. A canal, four miles long, connects the Gulf of Corinth with the Gulf of Aegina; it was opened in 1893, and it may help to revive the fortunes of Corinth.

Pyrgos is a modern town, standing near the ancient Olympia, famous for its athletic contests.

Missolonghi, where Lord Byron died in 1824, is a port of a currant-growing district.

Volo is the chief port of Thessaly, and its trade is growing rapidly. Larissa, on the Salembria, is the capital of Thessaly.

The Ionian Islands rise from a subterranean platform which extends seawards from the western coast of Greece. Most of the inhabitants live on the east side of the islands because the land is more fertile and the bays are safer than on the west. The islands are, however, subject to earthquakes.

Cephalonia, Zante and Leucas export **currants**. Corfu is noted for **olive oil**.

Euboea is separated from the mainland by a long narrow channel, which, near Chalcis, has been bridged. Mount **Delphi**, the highest point, was once famous for its oracle. Euboea has fertile soil, and produces wine, corn, cotton and silk.

The Cyclades probably are the summits of sub-marine mountain chains; as a rule these islands are bare, rocky and lacking in water.

Milos is of volcanic origin, and produces sulphur, manganese ores and other minerals. **Santorin** is part of an old crater. **Paros** is still, as in former times, noted for white statuary marble. On **Syra** is the town of Hermupolis, a coaling-station and trading-port. **Delos**, the sacred island, is famous for its temple dedicated to Apollo. The **Sporades**, or Scattered Islands, lie to the north-east of Euboea; about seventy of these belong to Greece.

EXERCISES.

1. What races of people live south of the River Danube in the Balkan peninsula? Point out the chief differences in the habits, occupations and religion of these races.

2. "Constantinople is the only town in the Mediterranean region with more than a million inhabitants." What geographical conditions help to account for the presence of so great a city at this particular place?

3. The imports into the United Kingdom from Greece are valued at £1,943,000 per year.

BRITISH IMPORTS FROM GREECE.

Articles.	Value. £1000.
Currants, - - - - -	1,437
Raisins, - - - - -	60
Iron Ore, - - - - -	210
Sponges, - - - - -	98
Stone (Hewn), - - - -	32

What percentage was each article of the whole imports? Say what you know of the production of (*a*) currants, (*b*) sponges.

4. Describe the position and importance of the Corinth Ship-Canal. How many miles are saved in travelling from Patras to Piraeus (Athens) via the canal?

5. Compare the Ionian Islands with the Cyclades.

LESSON XL.

THE DANUBE STATES.

1. Draw the course of the Danube from Belgrade to the Black Sea, and measure the length in miles.

Mark on the map

(*a*) the chief tributaries which enter this part of the Danube;
(*b*) the chief points where the Danube can be crossed;
(*c*) with shading, the land which does not exceed 600 feet in height, and on this area mark the chief crops grown.

2. Measure in square miles the area of Bulgaria, Servia and Roumania. (Use transparent squared paper.)

3. Find the elevation of the following:—Sophia, Belgrade, Bukharest, Burgas, Rustchuk.

Bulgaria.—The principality of Bulgaria consists of fertile lands on both sides of the Balkans. To the north of these

mountains an undulating plain slopes down to the Danube; the plain is almost treeless, and it is deeply eroded by many streams which flow into the Danube. **Agriculture** is the principal industry, the chief crops being wheat, maize, barley, rye and oats. Some of these **cereals** are exported from Varna on the Black Sea.

South of the Balkans are the fertile valleys of the upper Maritza and Tunja. **Wheat**, and even rice, are grown on the alluvial soils of these valleys; while on the hill-slopes **vines** and **rose trees** are extensively cultivated. An aromatic oil called *attar of roses* is obtained from the petals of roses, and it is said that three thousand pounds weight of rose petals are needed to obtain one pound of the perfume. **Kazanlyk** and **Slivno** are the most important centres of this industry.

Coarse woollen cloth, carpets and leather, are the only articles manufactured in the country, and they are for home use and not for export.

Sofia, the capital, stands on a plateau surrounded by lofty mountains; it is situated at the intersection of trade routes. **Tirnova**, the old capital, is on the River Jantra. It occupies a central position for the Balkan passes and for the roads to Sistova and **Rustchuk**, where the Danube can be crossed. **Shumla** commands the passes of the Eastern Balkans, and also the road to Roumania and Russia.

On the Bulgarian side of the Danube many towns have been built, because the bank is high and the towns are safe from flooding. **Silistria** and **Viddin** are fortified posts.

Philippopolis (so called from Philip of Macedon), the chief town of Eastern Roumelia, is the centre of a very productive region, and the trade routes along the Maritza and across the Balkans meet here.

Burgas, on the Black Sea, exports grain; salt is obtained from the lagoons in the neighbourhood.

The **Bulgarians** belong to the same race as the Finns, and they settled at first on the banks of the Volga (the word Volga is probably a corruption of Bulgar). In the seventh century they entered the Balkan peninsula, conquered the Slav inhabi-

tants, and settled south of the Danube. After a time they not only became Christians, but they even adopted the language and civilisation of their subjects.



FIG. 76.—BALKAN PENINSULA SHOWING THE POLITICAL DIVISIONS.

In the fifteenth century they were subdued by the Turks; under the bad government of the Turks all progress ceased, many of the people took refuge in the forests and mountains in order to escape the tyranny and extortion of their rulers. At length the oppressive acts of the Turks, known as the Bulgarian

atrocities, caused Russia to interfere in 1878, and as a result Bulgaria gained her independence. A few years later the people of Eastern Roumelia, who are kinsmen of the Bulgarians, threw off the Turkish yoke. Since that time the country has made great progress. The Bulgarian farmer has shown himself to be thrifty and naturally intelligent, and anxious to improve his methods.

Servia.—The kingdom of Servia is entirely surrounded by land. It is a very mountainous country intersected by the valley of the Morava. The slopes of the mountains are well wooded, the lower hill tracts and the valleys are very fertile. In the forests of **oak** and **beech** trees great numbers of pigs are fed on acorns and beech nuts. The majority of the people of Servia depend on agriculture for a living. **Maize** is grown in large quantities, as it is the staple food of the people, and wheat (for export), barley, hemp, flax and tobacco are also grown. **Vineyards** and **fruit** gardens cover the hill-slopes above the Morava valley; dried **plums**, under the name of prunes, are largely exported.

Though minerals (coal, copper, iron, zinc), exist in Servia, they are but little worked.

Belgrade, the capital of Servia, has always been famous as a frontier fortress—the castle stands on a hill between the rivers Save and Danube. During the last 400 years it has been taken and retaken many times by the Turks, Hungarians and Austrians. It is a centre of trade between Buda Pesth on one side and Constantinople and Salonica on the other.

Nish, at the junction of the Nishava and Morava, is the meeting-place of many roads and railways.

The people of Servia.—Nearly all the inhabitants of Servia belong to the **Slav** race. For 700 years they were the most powerful people in the Balkan peninsula, but in 1389 they were conquered by the Turks. While under Turkish rule they never forgot their former greatness. Many of them refused to submit, and they took refuge in the Kopaonik Mountains and in the forests of the mountainous country round Kragnyevats. With great persistence they carried on a guerilla warfare against

the Turks until their independence was acknowledged by the Treaty of Berlin in 1878. This long contest with the Turks may account for the want of tranquillity, and for the violence of party strife which have characterised Servia in recent years and retarded its progress.

Lack of enterprise and want of capital prevent the development of manufactures; a few articles, such as clothing, carpets, etc., are made in the peasants' houses, but without organisation and division of labour industrial progress is impossible.

Roumania is an extension of the great Russian plain; it is formed of **Wallachia, Moldavia** and **Dobruja.** Many rivers flow from the Carpathians, and they have deposited much alluvial soil on their flood-plain. In Moldavia great tracts are covered with **black earth** (like the wheat belt of Russia), and through it the rivers Sereth and Pruth have cut deep valleys. These rivers are navigable, and on them, timber from the Carpathians and grain are carried to Galatz.

The river Aluta rises in Transylvania, breaks through the mountains, and crosses the plain to the Danube; from the junction onwards the left bank of the Danube is low and swampy, and for a great distance the marshes extend along the river, making the approach difficult.

The **Danube,** however, gives Roumania three hundred miles of **navigable** waterway, and the best channel of the delta, the **Sulina** mouth, is in Roumanian territory. The Danube is crossed by two bridges, one at Ternu-Severin and the other at Tchernavoda (a railway from Bukharest to Constanta crosses at this town).

Productions.—Roumania is an agricultural country, and 70 per cent. of the population depends on the land for a living. By far the most important crop is **maize**—immense tracts are given up to the cultivation of this cereal. Not only is it the chief food of the people, but, with the exception of the United States, the export of maize is greater than that of any other country in the world. **Wheat, oil-seeds** and **tobacco** are also cultivated; on the sunny foot-hills of the Carpathians, and in southern Moldavia, **wine** is largely produced. **Forests** of fir,

beech, ash, oak and elm, cover the slopes of the Carpathians, and in the forests herds of swine and goats are kept. On the **pasture**-lands, between the Sereth and Pruth, cattle and horses are reared, while sheep are fed on the hilly country to the west.

The **Dobruja** is a steppe-like region, almost treeless, and with few fertile spots; in summer the soil is scorched, in winter covered with snow, while in spring it becomes a vast slough. On the pasture-grounds large numbers of cattle and sheep form the only wealth of the inhabitants.

Minerals.—**Petroleum** is obtained from the district south-west of Jassy and from the neighbourhood of Ploesci. **Rock-salt** is a Government monopoly, and is obtained near Okna.

Bukharest, the capital of Roumania, has a central position on the Wallachian plain; its position commands the routes to the mountain passes, to the lower Danube and to Russia. Within the last fifty years the city has been almost rebuilt, and now possesses fine buildings, and is a royal residence.

Jassy, in Moldavia, is the centre of an agricultural country; grain is collected here and sent away by river and rail to Black Sea ports.

Galatz and **Braila** are rival ports at the head of the Danube delta; they both export **grain**. At Galatz are large saw-mills, and Moldavian products find their way to this port; Braila is the Wallachian port.

Constanta (Kustenji), on the Black Sea coast, exports cattle from Dobruja, and trades chiefly with Constantinople.

People.—The Roumanians are probably descended from Roman colonists who settled in the Danube valley. They speak a language of Latin origin, although it has been modified by the influence of the Slav tongue. Like the other provinces of the lower Danube basin, Roumania was subject to Turkish rule for some centuries. During the nineteenth century Russian influence increased greatly, and, with the assistance of Russia, Roumania gained complete independence in 1878, and a little later became a hereditary kingdom. Under a better system of Government great progress has been made in developing the

resources of the country, the peasants having been encouraged to become proprietors of their farms. Most of the trade is in the hands of Greek and Jewish merchants, who trade chiefly with Great Britain, Belgium and Germany. There is practically no trade with Russia, because the productions of the two countries are very similar.

Montenegro (or black mountain, perhaps so-called because of the dark forests which once covered the whole country), is a high mountainous land which is isolated from its neighbours.

The north part belongs to the Karst region (see p. 175), and is a barren, waterless district, with a very rigorous climate. There are no roads—goods have to be carried on pack-horses. **Stock-raising** and **fishing** are the chief pursuits; food supplies have to be imported in large quantities. Wine and fruits are grown in some of the sheltered valleys.

The **Montenegrins** belong to the **Slav** race; they were the only people of the Balkan peninsula never conquered by the Turks. Living among mountains almost inaccessible, they became a race of **warriors**, and carried on an irregular but persistent warfare against the Turks. They belong to the Greek church, and so Russian influence has always been great in the principality. By the treaty of Berlin, Montenegro acquired a small strip of coast, but no serviceable harbour. From the bay of Cattaro there is a steep ascent to **Cetinje**, the capital.

EXERCISES.

1. Examine the map, Fig. 74. Say what you notice with regard to the distribution of towns in the lower Danube Valley.

   Point out the advantages of the position of Belgrade for communication.

2. Compare the Dobruja and the Thracian steppes.

3. Write an account of the inhabitants of the Lower Danube valley as regards race, religion and occupations.

APPENDIX I.

ADDITIONAL EXERCISES.

Scotland.

POPULATION FROM THE CENSUS RETURNS, 1911.

County.	Area sq. mls.	Population.	County.	Area sq. mls.	Population.
Shetlands and Orkneys,	927	53,807	Stirling,	467	161,003
Caithness,	701	32,008	Dumbarton,	270	139,831
Sutherland,	2,126	20,180	Argyll,	3,213	70,901
Ross and Cromarty,	3,260	77,353	Bute,	225	18,186
Inverness,	4,323	87,270	Renfrew,	254	314,594
Nairn,	169	9,319	Ayr,	1,149	268,332
Elgin,	488	43,427	Lanark,	889	1,447,113
Banff,	646	61,402	Linlithgow,	127	79,456
Aberdeen,	1,971	311,350	Edinburgh,	367	507,662
Kincardine,	383	41,007	Haddington,	280	43,253
Forfar,	890	281,415	Berwick,	464	29,643
Perth,	2,601	124,339	Peebles,	356	15,258
Fife,	513	267,794	Selkirk,	260	24,600
Kinross,	78	7,528	Roxburgh,	670	47,192
Clackmannan,	38	31,121	Dumfries,	1,103	72,824
			Kirkcudbright,	954	38,363
			Wigton,	512	31,990

CHIEF TOWNS IN SCOTLAND.

Town.	Population. 1911.	Town.	Population. 1911.
Glasgow,	872,021	Leith,	85,721
Edinburgh,	355,366	Greenock,	72,300
Dundee,	169,409	Kilmarnock,	35,010
Aberdeen,	181,918	Perth,	32,872
Paisley,	91,930		

1. Find the population per square mile of each county of Scotland. Make a density of population map, and compare it with an industrial map of Scotland. (See questions on England, p. 2.)

2. From the table which follows make a similar map for Ireland.

Ireland.

POPULATION FROM THE CENSUS RETURNS, 1911.

County.	Area. sq. mls.	Population.	County.	Area sq. mls.	Population.
Prov. of Leinster.			*Prov. of Ulster.*		
Carlow, - -	349	36,151	Antrim, - -	1,211	478,603
Dublin, - -	354	476,909	Armagh, - -	512	119,625
Kildare, - -	654	66,498	Cavan, - -	746	91,071
Kilkenny, -	800	74,821	Donegal, - -	1,870	168,420
King's, - -	772	56,769	Down, - -	957	304,589
Longford, -	421	43,794	Fermanagh, -	715	61,811
Louth, - -	316	63,402	Londonderry, -	816	140,621
Meath, - -	906	64,920	Monaghan, -	500	71,395
Queen's, - -	664	54,362	Tyrone, - -	1,260	142,437
Westmeath, -	708	59,812			
Wexford, -	901	102,287			
Wicklow, -	781	60,603			
Prov. of Munster.			*Prov. of Connaught.*		
Clare, - -	1,332	104,064	Galway, - -	2,372	181,686
Cork, - -	2,890	391,190	Leitrim, - -	619	63,557
Kerry, - -	1,859	159,268	Mayo, - -	2,156	191,969
Limerick, -	1,064	142,846	Roscommon, -	991	93,904
Tipperary, -	1,659	151,951	Sligo, - - -	707	78,850
Waterford, -	717	83,766			

CHIEF TOWNS IN IRELAND.

Town.	Population. 1911.	Town.	Population. 1911.
Belfast, - - - -	385,492	Londonderry, - -	40,799
Dublin, - - - -	309,272	Rathmines, - -	38,190
Cork, - - - -	102,274	Waterford, - -	28,145
Limerick, - - -	46,725	Kingstown, - -	17,227
Galway, - - - -	15,936	Kilkenny, - - -	13,112

Altitude of the Sun.

3. In Fig. 77 **BC**, **BD**, **BF** receive the same number of rays. **BC**, drawn at right angles to the rays, is less than **BD** or **BF**. It is evident, therefore, that the intensity of the sun's rays will be greatest on an area represented by **BC**; and it is also evident that the intensity depends on the angle which the sun's rays make with the surface; the angle is the altitude of the sun.

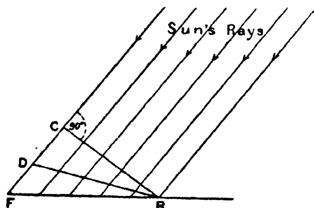


Fig. 77.

As Europe lies outside the Tropics, the only case in which the sun's rays can be perpendicular to the surface of the land is when **BC** represents the southern slope of a mountain.

The altitude of the sun on any day in the year may be found by subtracting the latitude from 90°, and then adding the declination of the sun when the sun is north of the equator, and subtracting when the sun is south. (The declination of the sun is its angular

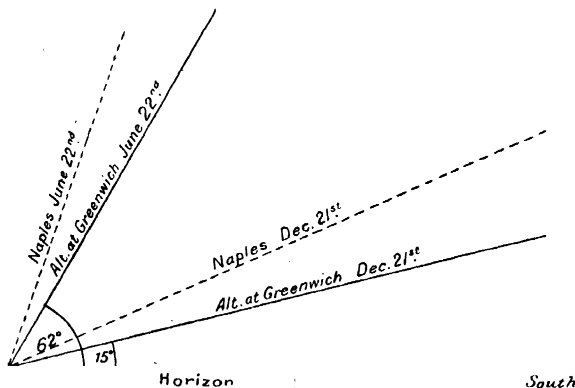


Fig. 78.—Altitude of the Sun at the Solstices for Greenwich and Naples.

distance north or south of the equator; at the equinoxes, March 21st and September 22nd, the declination is 0; at the solstices the declination is $23\frac{1}{2}$°, the greatest declination possible.)

The altitude of the sun at Greenwich on June 22nd

$$=90° - 51\frac{1}{2} + 23\frac{1}{2} = 62°.$$

The altitude of the sun at Greenwich on December 21st

$$=90-51\frac{1}{2}-23\frac{1}{2}=15^\circ.$$

These angles are shown in the diagram, Fig. 78; it should be noted (*a*) that the position of the sun for any day of the year will fall between those shown on the diagram, (*b*) that the sun appears to move through an angle of $(62^\circ-15^\circ)=47^\circ$ or twice $23\frac{1}{2}^\circ$, (*c*) that the sun never shines vertically at Greenwich.

The dotted lines show the altitude at Naples (latitude 41° N.) for the same dates.

Draw diagrams to show the altitude of the sun at the solstices at Archangel (latitude 65° N.) and at Neuchâtel (latitude 47° N.).

4. At what angle would the side of a mountain (situated in the latitude of Neuchâtel) have to slope for the sun's rays to be perpendicular to it at noon on June 22nd?

Variation of Day and Night.

The diagram, Fig. 79, shows the length of day and night for any place on the earth's surface at the winter solstice.

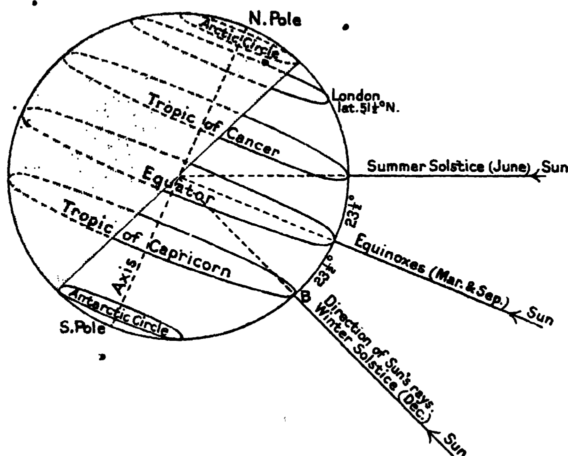


FIG. 79.—LENGTH OF DAY AND NIGHT AT THE WINTER SOLSTICE.

At the winter solstice the sun is vertical on the Tropic of Capricorn. In the diagram the point B is on Capricorn. A line drawn from the centre of the earth through B gives the direction of the

sun's rays vertical to the surface of the earth at B. As the earth turns on its axis once in 24 hours, every point on Capricorn must pass through B (that is at noon).

A plane (passing through the centre of the earth) at right angles to the direction of the sun's rays will divide the earth's surface into hemispheres, one light and the other dark. Hence the broken lines in the circles show the length of the night; the unbroken lines the length of the day.

5. From the diagram find roughly the length of day and night, at the winter solstice, for London; also for places on the Tropics, the Arctic Circles, the Equator.

6. Point out on the diagram where these places will have sunrise, sunset, noon, midnight.

7. Draw similar diagrams for the equinoxes and the summer solstice.

Apparent Path of the Sun.

The apparent path of the sun throughout the year for an observer in London (latitude 51½° N.).

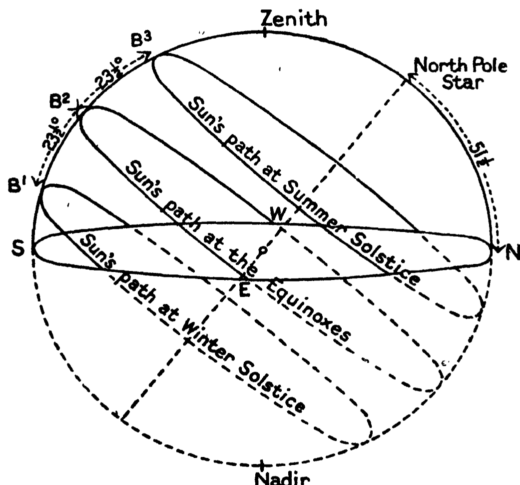


Fig. 80.—Apparent Path of the Sun for Lat. 51½° N.

The circle represents the celestial sphere. O is the position of the observer in latitude 51½°N., ESWN is the horizon.

Since the altitude of the North Pole Star is the same as the latitude, measure from *n*, on the horizon, 51½°, and mark the North Pole Star. Draw a line through the centre. A circle drawn on a plane at right angles to this axis will give the path of the sun at the equinoxes. The other circles are drawn 23½° on either side of this one, as in the diagram.

The part of the sun's path above the horizon (an unbroken line) represents the day; the path below the horizon (the broken line) represents the night.

On any day of the year, therefore, the sun rises on the east side of the horizon; it reaches its highest point above the horizon at B (noon), and then sets on the west side of the horizon.

The variation of day and night throughout the year can be seen on the diagram.

8. Draw diagrams for observers on the Equator (latitude 0), on Tropic of Cancer (latitude 23½° N.), on the Arctic Circle (latitude 66½°), at the North Pole (latitude 90°).

APPENDIX II.

WEIGHTS AND MEASURES OF THE VARIOUS COUNTRIES, WITH THE BRITISH EQUIVALENTS.

COUNTRIES.	FOREIGN.	BRITISH EQUIVALENTS.
Russia, - - -	Poud, - - - -	36 lbs. avoirdupois.
Sweden, - - -	Metre, - - - -	1·09 yards.
German Empire, -	Cubic metre, - -	1·308 cubic yards.
Netherlands, - -	Kilogramme, - -	2·204 lbs. avoirdupois.
Belgium, - -	Quintal metrique, -	220·4 ,, ,,
France, - - -	Centner ,, -	220·4 ,, ,,
Switzerland, - -	Tonneau (Coals), -	2,204 ,, ,,
Austria-Hungary, -	Litre, - - -	1·76 imperial pints.
Spain, - - -	Hectalitre (Liquid), -	22 imperial gallons.
Italy, - - -	,, (Cereals), -	2·75 imperial bushels.

MONEY OF THE VARIOUS FOREIGN COUNTRIES, WITH THE BRITISH EQUIVALENTS.

COUNTRIES.	FOREIGN.	BRITISH EQUIVALENTS.
		£ s. d.
Russia,	Rouble,	0 2 1⅓
Sweden,	Krona,	0 1 1⅓ or 18 to the £
German Empire,	Mark,	0 0 11$\frac{8}{10}$
Netherlands,	Gulden,	0 1 8
Belgium, France, Switzerland,	Franc,	0 0 9$\frac{6}{10}$ or 25 to the £
Spain, Italy,	Peseta, Lira,	0 0 9$\frac{6}{10}$ or 25 to the £
Austria-Hungary,	Krone,	0 0 10

APPENDIX III.

The Inhabitants of Europe.

The races of people in Europe are sometimes classified according to languages. The geographical area in which a language is spoken does not always correspond to the area in which a particular race lives. Language is not a sure test of race; for example, the Normans, who belonged to the Teutonic race, adopted a Romance tongue after they settled in Normandy; the French are descended mainly from Celtic and Teutonic ancestors, but they speak a Romance language.

As a rule, however, language may be taken as a rough guide in classifying races of people.

The races of people living in Europe at the present time may be classified as follows:

I. Aryan Races.

(a) Celtic,
- Welsh.
- Manx.
- Gaels (Scotland and Ireland).
- Bretons.

(*b*) Teutonic,	Swedes, Norwegians, Danes, Icelanders,	Norse.
	English, Dutch, North Germans, Flemings, Frisians,	Low Germans.
	South Germans (Bavarians, etc.), Austrians,	High Germans.

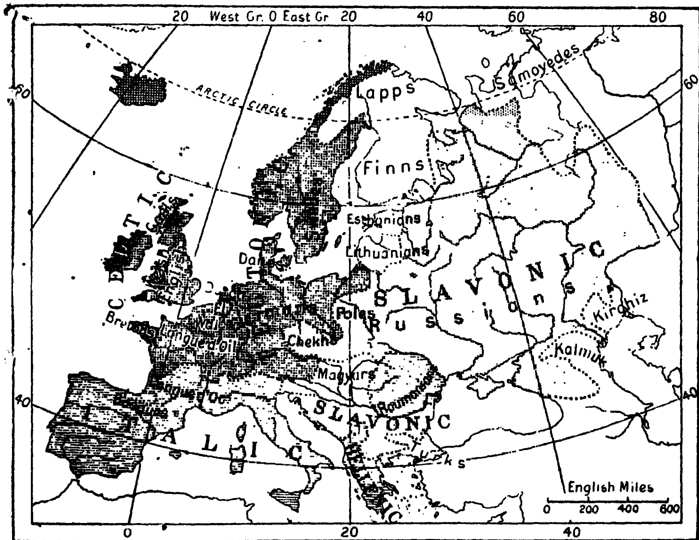


FIG. 81.—DISTRIBUTION OF RACES IN EUROPE.

(*c*) Romance,	Italians. French. Spaniards. Portuguese. Roumanians. Walloons.

(*d*) Greek, { Greeks. / Albanians. }

(*e*) Slavonic, { Russians. / Serbs. / Chekhs. / Poles, Ruthenians. / Wends, Croats, Slovaks. }

(*f*) Lithuanians and Letts.

II. Non-Aryan Races.

Finns,
Lapps,
Esthonians,
Samoyedes, } North and North-East Europe.
Basques (Pyrenees).
Hungarians (or Magyars).
Turks.
Kirghiz,
Kalmuks, } South-East Europe.
Arabs in Malta.
Jews everywhere.

According to the above classification there are about

100	millions belonging to the	Teutonic race.
100	,, ,,	Romance-speaking races.
90	,, ,,	Slavonic.
3½	,, ,,	Celtic.
3	,, ,,	Lithuanians and Letts.
18	,, ,,	Non-Aryan races.

In religion, people of the Slavonic race generally belong to the Greek Catholic Church; Romance peoples belong to the Roman Catholic Church, while Teutonic peoples are mostly Protestants.

EXAMINATION QUESTIONS.

The examination questions are selected from papers in Geography set in recent years. Permission to *print the questions* has been kindly given by the following authorities: the University of London; the Oxford Delegacy and the Cambridge Syndicate for the Local Examinations; the Council of the College of Preceptors; the Controller of H.M. Stationery Office.

The following abbreviations are used: O.S., Oxford Senior; O.J., Oxford Junior; O.P., Oxford Preliminary; C.S., Cambridge Senior; C.J., Cambridge Junior; C.P., Cambridge Preliminary; L.M., London Matriculation; Col. Prec., College of Preceptors; Cert., Certificate; Prelim. Cert., Preliminary Certificate.

British Isles.

1. Show how the distribution of the population in Wales is related to the physical features and natural resources of the country. (C.S.)

2. Describe the position of the coalfields of Scotland, and the principal manufacturing towns that have grown up on them. (C.S.)

3. A number of seaports in the British Isles are used as calling places by ocean-going mail steamers. Name and describe the positions of *two* such ports, and explain fully why they are so used. Describe the routes connecting the ports you name with London. (O.J.)

4. State and explain the reasons why the eastern counties of England are specially adapted for the cultivation of wheat. (O.J.)

5. The borderland of England and Wales is a specially favoured agricultural region. In what respects is it specially favoured?
Account for the facts. What are the most important crops produced? Name two of the chief towns in the district. (O.J.)

6. "Early British trade with the Continent produced a series of towns along the southern and eastern coasts."
Give *three* examples of such towns.
Describe and account for their positions.
Say whether they have flourished or decayed in modern times, and account for the facts. (O.S.)

7. Give the positions of the ports on the west coast of England and Wales, from north to south, and account for their growth or decline. (C.S.)

8. Describe the positions of the two chief districts in England. which produce iron ore.

Compare the two districts as regards (*a*) the supplies of coal for smelting, and (*b*) the most important manufactures carried on.

Name the most important town in each. (O.S.)

9. Describe and account for the positions of three regions in England or Wales, one of which is specially noted for cattle-rearing, another for sheep-rearing, and the third for wheat-growing. (O.P.)

10. Describe the position of the South Wales coalfield. Explain why large quantities of Welsh coal are exported to foreign countries, and name the seaports from which most of it is shipped. (O.P.)

11. In the geography of British coal:
(*a*) Where are the chief coalfields in the British Isles?
(*b*) What special ports help to distribute British coal?
(*c*) What great manufactures depend upon it?
(*d*) Who are the chief coal "customers" of the United Kingdom?
(Col. Prec.)

12. The ports of the east coast of Ireland are far more important than those of the west, although the latter possess the best natural harbours. Account for this, and name two chief ports on each coast which illustrate your explanation. Describe their positions and give an account of their trade. (O.J.)

13. Account for the sparse population of Ireland; describe the surface features of the interior of that country; state in which part population is thickest; name two chief towns in that part; give reasons for the greater density there. (C.J.)

14. Give a geographical account of Ulster, describing its physical features and climate, and naming its chief industries and towns.
(C.S.)

15. Compare the course of the River Severn with that of the River Shannon. (O.J.)

16. Give some account of the climate of the British Isles, pointing out the effects of the physical configuration of the country, the prevailing winds, and the surrounding waters. (O.J.)

17. More than three-quarters of the surface of Scotland is practically waste land, while less than one-quarter of Ireland is unproductive. How do you account for the difference? (O.J.)

18. What are the chief differences between the physical features of the east and west coasts of Scotland? (C.P.)

19. Draw a sketch-map of the English Channel, marking the Chesil Beach, the Downs, Dunkirk, Eddystone Lighthouse, Jersey, St. Malo, the Solent, Spithead. Mark three usual passenger routes between England and France, inserting the names of the ports at

each end. Insert the names of two capes and two river mouths on the English coast, also of two capes and two river mouths on the French coast. (C.J.)

20. Trace one of the routes by which a traveller may pass within twenty-four hours from Dublin to Newcastle-on-Tyne, and mention the industries of the districts traversed in the land part of the journey. (C.J.)

21. Draw a map of the Irish Sea, marking and naming the chief ports on its shores, and indicating the chief lines of communication between Great Britain and Ireland. (C.S.)

22. Give the position of one of the principal towns associated with each of the following industries, and account for the connection of the town with the industry in each case: (*a*) linen, (*b*) cotton, (*c*) jute, (*d*) pottery, (*e*) cutlery. (C.S.)

23. Give some account of the differences in temperature and rainfall in different parts of the British Isles. (C.S.)

24. Describe the course of the Shannon and its tributaries, naming the chief towns on its banks, and giving some account of the industries of the region it drains. (C.S.)

25. "Almost the whole foreign trade of Great Britain is carried on in four inlets on the east coast, three on the west, and one on the south." Name the ports referred to in this statement and the chief trade of each. (O.J.)

26. What are the chief towns passed in travelling from London to Chester by the G.W.R.? What coalfield is traversed and what chief rivers are crossed? (O.J.)

27. What parts of the British Isles are (*a*) wettest, (*b*) driest, (*c*) warmest in summer, (*d*) coldest in winter, (*e*) of least range of temperature? How would you account for the differences? (C.S.)

28. Mention in order from north to south the chief industries of the east coast of England, and explain why they flourish in their respective districts. (C.S.)

29. Describe the chief physical features of the Lowlands of Scotland and give the positions of the chief towns in them. (C.S.)

30. Name (*a*) the principal wheat-growing district, (*b*) the principal sheep-rearing districts, and (*c*) the principal cattle-rearing districts in England. State the natural conditions which favour wheat-growing, sheep-rearing, and cattle-rearing in the districts you name. (C.S.)

31. Describe briefly the routes of the main lines of railway in Scotland, and show how they have been determined by the physical and economic geography of the country. (C.S.)

32. Describe the physical features of the Pennine Chain and the English Lake district. Where do railways cross the Pennine Chain? (C.S.)

33. Draw a sketch-map showing the position and the main features of the topography of the Southern Uplands of Scotland. Show the principal rivers and lines of railway, and mark the chief towns. (O.S.)

34. Describe the physical characters of the west coast of Ireland, and point out any resemblances and differences between it and the west coast of Scotland. (C.S.)

35. Show how the differences in the present condition of Scotland and Ireland are due to differences of land-conformation and of climate. What other geographical factors should be taken into account when considering the relative importance of these countries? (Cert.)

Baltic Sea.

1. Compare the Mediterranean and the Baltic with respect to their extent, depth, temperature, and movements. (C.S.)

2. Name in order the countries which touch the Baltic Sea, and give the names and positions of two gulfs and two islands in that sea. In what way is commerce in the Baltic impeded by physical conditions? (C.J.)

3. What are the chief commodities of the Baltic trade? What obstacle does the Baltic offer to regular navigation? What is there in the situation of the Baltic to account for the obstacles? (O.J.)

4. The Baltic Sea is constantly overflowing, while the Mediterranean is constantly receiving an inflow from the Atlantic. How do you account for this? (O.S.)

5. Draw a map of the Baltic and North Seas. Mark on it the routes from the east coast of Great Britain to the Continent, and name the principal ports. (L.M.)

6. Draw a map of the entrance to the Baltic Sea from the North Sea. Extend your map to include the mouths of the Weser and Oder and the Kaiser Wilhelm Canal. (Col. Prec.)

7. The phrases "Baltic Trade" and "Black Sea Trade" are commonly used in the commercial world. Show in what the trade differs, and for what reasons.

Name the ports in Britain and in the exporting countries which are concerned with each. (Cert.)

Scandinavia—Denmark.

1. Describe in outline the general relief, the climate, and the natural resources of the Scandinavian peninsula. Contrast the territory of the Norwegians with that of the Swedes, and show how the differences of country influence the lives and occupations of the people. (C.S.)

2. Describe the physical features and the climate of the Scandinavian peninsula. Give reasons for the peculiarities of its climate. State the chief exports and imports of Norway and Sweden, and name four of their principal commercial towns (C.J.)

3. In what geographic respects is south-eastern Sweden (*a*) like, and (*b*) unlike northern Italy? Account for the differences. (L.M.)

Russia.

1. In what vegetation belts may Russia be divided? Account for them, and indicate broadly their limits. Distinguish between the western and the eastern portions of the southern belt, and give reasons for the difference. Describe the position of six Russian towns—at least one for each of the areas you have mentioned—and say why each is important. (C.S.)

2. Describe the course from source to mouth, giving the chief tributaries, of the Volga. Name the principal towns on the banks of the river and its tributaries. (C.S.)

3. Insert on an outline map of Russia, the Caucasus Mountains and the Valdai Hills. Trace the courses of the Volga and Petchora and any important tributaries of these rivers. Name three of the fresh-water lakes, and indicate the regions of tundras and steppes. Mark and name Astrakhan, Corfu, Cracow, Danzig, Moscow, Reval, Samara. Sketch the track of the Siberian Railway as far as the Asiatic Border. (C.J.)

4. Describe the geographical conditions of the steppe, and show their influence on life there. (L.M.)

5. Discuss the relation of climate to the typical belts of vegetation in European Russia. (L.M.)

Germany.

1. Describe the coast of the German Empire, give the positions of the principal ports, and state the facilities which each possesses for communication with the interior of the country. (C.S.)

2. Describe the position of three important industrial districts of Germany. What does each produce? Mention the names of two towns in each. (O.J.)

3. On a map of Germany (*a*) draw the course of the Rhine; (*b*) insert Berlin, Breslau, Cologne, Danzig, Dresden; (*c*) name the countries which bound Germany to the east and west. (O.J.)

4. Draw a map of the Rhine and its tributaries, and mark and name the principal towns on their banks. Give a short account of the commercial importance of the Rhine. (C.S.)

5. Describe by sketch-map or otherwise the coast of Germany from the mouth of the Vistula to the mouth of the Weser, giving the position of the island of Heligoland, and the towns of Kiel, Danzig, Stettin, Hamburg. (O.P.)

6. Give some account of the mineral resources of the German Empire. (O.S.)

7. Compare the Rhine and the Danube in physical character and commercial importance. (L.M.)

8. Compare in general terms the physical features, climate, people, and productions of North and South Germany. (C.P.)

9. Compare in general terms the physical features, climate, people and productions of either (*a*) North and South Germany, or (*b*) Holland and Belgium. (Prelim. Cert.)

Netherlands.

1. Describe the physical features and name the products and chief towns of Holland. (C.J.)

2. Describe the delta of the Rhine, giving (*a*) its position and extent, (*b*) its physical characteristics, (*c*) its vegetable products, (*d*) its towns. (C.S.)

3. Compare in general terms the physical features, climate, people, and productions of Holland and Belgium. (C.P.)

France.

1. Why is the Rhone-Saône valley so important a feature of Western Europe? Draw a sketch-map of the river system from which this valley derives its name, marking the adjoining highlands and indicating three natural routes from the main valley into neighbouring regions. Mark also the two great French cities situated in this region, and one important town on each of the branch routes indicated. (C.S.)

2. Name three important exports from France to the United Kingdom, and state in what part of the country each is produced. Where is the chief coalfield of France? (O.S.)

3. Where are the chief mining districts and the chief agricultural districts in France? What are the products of each district? (C.S.)

4. State the chief commodities imported by England from France, mentioning the districts or towns in France where each is chiefly produced. (O.J.)

5. Describe the inland routes by which it is possible to convey goods by water from Bordeaux to Marseilles. (O.S.)

6. Give an account of the physical features and industries of the region drained by the Rhone and its tributaries. (C.S.)

7. Select *three* important towns in France (excluding Paris). Describe their positions, and point out in each case the conditions which have made them important. (O.S.)

8. Draw a map of France, marking the towns of Bordeaux, Toulon, Rennes, and Amiens; the rivers Garonne and Somme; the Auvergne and Vosges Mountains; the isles of Ré and Oléron; Cape de la Hague; the Peninsula of Quiberon. (O.P.)

9. Write a short account of France under the following headings:
(*a*) Highland regions.
(*b*) Useful rivers.
(*c*) Most important towns. (Col. Prec.)

Switzerland.

1. Give some account of the Alps. How would you divide the system for purposes of description? State, or show by a sketch-map, the position of each of the divisions you name, and point out any special features of general elevation, form of ranges and valleys, important summits and passes in each division. (O.S.)

2. Give an account of the chief passes over the Alps, showing the regions they connect, and indicating those passes that have railways. (C.S.)

3. Describe the river system of Switzerland, with special reference to trade routes. (L.M.)

4. Where are the Alps? With what are the upper slopes of the high mountains covered? What fills up the valleys just below them? Why? Name three rivers which rise in the Alps and a town on each. (Col. Prec.)

5. What is a pass? What is the importance of passes? Where is the St. Gothard Pass? Name important towns connected by the St. Gothard Railway. (Col. Prec.)

Austria-Hungary.

1. Draw a sketch-map of the Danube and its tributaries, marking on the map the countries through which it flows and the position of the important towns on the banks of the river and its tributaries. (C.S.)

2. Name three important tributaries of the Danube, and describe the course of each tributary named and the character of the country through which it flows. (C.J.)

3. Give an account of the plain of Hungary, referring specially to its surface configuration, boundaries, climate, and population. State any geographical conditions which favour it (*a*) as an agricultural region, and (*b*) as a manufacturing region. (O.S.)

4. Draw a sketch-map showing the course of the Danube. Show the points where it enters and leaves the basin of Hungary. Indicate the positions of the sources of the Rhine and Elbe. Name the countries on each side of the lower Danube. Mark the towns Ulm, Passau, Vienna, Budapest, and Bukharest. (O.S.)

5. Draw a rough sketch-map showing the countries and provinces included in Austria-Hungary. Explain why Austria-Hungary has "a greater variety of geographical features and climates" than any other country in Europe. (O.S.)

6. Compare Germany with Austria-Hungary in respect of (*a*) internal relief, (*b*) relation to the outside world. (L.M.)

Mediterranean.

1. Describe exactly the position of six of the principal islands of the Mediterranean, and state the political relations of each. Name and state the position of the active volcanoes of the Mediterranean. (C.S.)

2. Mention six of the most important seaports of the Mediterranean. Give a description of one of them, stating the causes of its importance. (O.J.)

3. The chief characteristic of the climate of the Mediterranean region is that most of the rain falls during the winter months. Explain fully how this occurs. (O.J.)

4. The Mediterranean region is specially a *fruit*-producing region. How do you account for this? What are the chief fruit crops produced? Name a district specially noted for each of the fruit crops. (O.J.)

5. The Mediterranean region is to a great extent cut off from Europe by a barrier of mountains. Indicate this barrier on an

outline map, writing in the names of the chief parts of which it is made up. Mark and name the chief lines of communication passing over or through the barrier. (O.J.)

6. Large parts of the Mediterranean region are covered by evergreen forests. Describe some of the chief trees found in these forests, and mention any useful products obtained from them. What has been the result of injudicious clearing of these forests? (O.J.)

7. Marseilles is the greatest port of the Mediterranean. Describe its position, and give an account of its trade and of the geographical causes which have led to its supremacy. (O.J.)

8. The Mediterranean region produces large quantities of silk. Describe the positions of the chief silk-producing regions, and explain the geographical conditions which favour the rearing of silk-worms. (O.J.)

9. Give some account of the minerals found within the Mediterranean region. Apply your answer to account for special features of the trade carried on in the Mediterranean. (O.J.)

10. Give the names, and describe the positions, of the chief naval stations of the Mediterranean, stating to what nation each belongs. (O.J.)

11. Account for the following facts:

(*a*) The Mediterranean is constantly receiving a surface current from the Atlantic.

(*b*) The winter temperature at Constantinople is 10° lower than that at Naples.

(*c*) The Mediterranean is a region of winter rainfall. (O.J.)

12. Choose four of the following commodities: Cork, currants, sulphur, attar of roses, esparto, mulberry. Explain what each of the four you choose is, what it is used for, and where in Mediterranean countries it is produced. (Col. Prec.)

13. A vessel leaves Marseilles, puts in at three different ports in the Mediterranean, and finally reaches Constantinople. Show, on a sketch-map, the track of the vessel, and describe the probable nature of the goods put on board at each port. (Col. Prec.)

Spain and Portugal.

1. Describe the physical features of the Iberian Peninsula. (C.S.)

2. On an outline-map (Spain and Portugal) mark the boundary of Portugal. Insert and name three mountain ranges (*not* the Pyrenees), also the courses of the Tagus, the Ebro, and the Guadalquivir; mark and name one town on each of these rivers.

Mark and name the towns: Badajoz, Barcelona, Bilbao, Cadiz, Granada, Oporto, Pamplona, Valencia. Insert the names of three capes. (C.J.)

3. Describe the physical features and the climate of the Iberian Peninsula. Give reasons for the peculiarities of its climate. State the chief exports and imports of Spain and Portugal, and name four of their principal commercial towns. (C.J.)

4. Give a short description of Gibraltar. What is the nature of its trade? (O.J.)

5. Draw a map of the Iberian Peninsula, marking and naming the rivers and principal ports. (C.S.)

6. Describe the country forming the basin of the Ebro. What are its chief products? To what extent is the river used for navigation? (O.J.)

7. Describe the general position and surface features of the Iberian central plateau. Indicate the effect of the plateau on (*a*) the climate, (*b*) the main lines of communication, and (*c*) the distribution of population in Spain. (O.S.)

8. Compare the Guadalquivir and the Rhone in physical character and commercial importance. (L.M.)

9. State what you know of the position, size, relief, climate, centres of population, and natural resources of Spain. (C.S.)

10. Write a short description of Spain under the headings of:

(*a*) River systems.
(*b*) Trade.
(*c*) Effect of geography on history. (Col. Prec.)

Italy.

1. Describe the physical features, and name the products and chief towns of the region drained by the Po and its tributaries. (C.J.)

2. Describe the position of the plain of Lombardy, mentioning its chief rivers and towns. What are the principal occupations of its people? (O.J.)

3. Draw an outline-map showing the land-frontier of Italy. Show where the boundaries between France and Switzerland, and between Switzerland and Austria-Hungary, meet it. Mark the positions of Mont Blanc, Monte Rosa, Turin, and Lake Maggiore. Show where the Simplon, Mt. Cenis, St. Gothard, and Brenner railways cross the frontier. (O.S.)

4. Describe the position of the chief Italian seaports. Give some account of their trade. (O.J.)

5. State what you know of the position, size, relief, climate, centres of population, and natural resources of Italy. (C.S.)

6. Describe the course of *one* of the main railway routes connecting northern Italy with the rest of Europe. Indicate any special features of its importance to international communications. Illustrate your answer by a sketch-map. (O.S.)

Balkan Peninsula.

1. Describe the climate of Greece.
Account for its characteristic features.
Apply your answer to explain why Greece both exports and imports agricultural produce. (O.S.)

2. Of what countries are Belgrade and Constantinople the capitals? Describe their positions, and the main route connecting them, naming the river valleys through which it runs and the chief towns it passes. (O.J.)

3. Analyse carefully the positions of Belgrade and Salonika. (L.M.)

4. Show the relation of relief and climate to the formation and development of political areas in the Balkan Peninsula. (L.M.)

GENERAL.

1. Describe a coasting yacht voyage from Calais to Genoa, naming river mouths, ports, and other objects of interest passed. (C.J.)

2. Describe one of the usual railway routes between London and Rome, naming rivers crossed and important towns and other objects of interest passed on the way. (C.J.)

3. Describe the chief mountain ranges of Europe, and state in what cases they form natural frontiers to political divisions. (O.S.)

4. State accurately the positions and character of Venice, Odessa, Nuremberg, Munich, Bruges, and account for the growth or decline in the importance of each city. (C.S.)

5. Give the positions and a brief account of the following islands, and name the country to which each of them belongs: Corfu, Corsica, Iceland, Majorca, Malta. (C.J.)

6. Describe the journey from London to Constantinople (*a*) by an overland route, (*b*) by a sea route. (O.J.)

7. Cork, London, Dresden, and Kief are nearly in the same latitude. What are the differences of climate between these places, and how do you account for the differences? (C.J.)

8. On an outline-map of Europe mark: The Appenine Mountains, Sierra Nevada, the Tell, Dardanelles, Straits of Messina, the Riviera; the rivers Tiber, Ebro, Rhone; the islands Corsica and Cyprus.

Show the positions of Montenegro, Thessaly, and Lombardy, and the towns Rome, Athens, Alexandria, Algiers, Smyrna. (O.J.)

9. Where are the chief wheat-growing regions in Europe? Account for their positions, and compare them with those of regions where rye is the most important crop. (O.S.)

10. State generally the geographical conditions which favour the growth of large modern seaports. Illustrate your answer by examples. (O.S.)

11. What seas lie between (*a*) Sweden and Russia, (*b*) France and Algeria, (*c*) Turkey and Russia? Name the capitals of these countries. (C.P.)

12. What parts of Europe are the most densely populated? How do you account for the facts? (O.S.)

13. Name three active European volcanoes, and describe their positions. (C.P.)

14. Draw a simple sketch-map of the Alps, the Apennines, and the Carpathians (using thick black lines); name these ranges and write in their proper places the names Little Carpathian Mountains and Rhaetian Alps; insert on your sketch and name the lakes Garda, Geneva, and Maggiore, and mark with a cross the points at which the Rhine and the Rhone rise; and mark and name Mont Blanc, Mont Corno, Trieste, and Vienna. (C.J.)

15. From what places and countries in Europe are (i) gold, (ii) lead, (iii) iron, (iv) salt obtained? (C.J.)

16. "Taking advantage of the *ebb-tide*, we made our way through the *pack-ice*: we were obliged to push a good way into the *fjord*, where on all sides *glaciers* thrust their precipitous walls of ice into the sea. Several times it happened that huge blocks from glaciers and *icebergs* fell into the water not far from us. We encamped for the night on a small islet, in *lat. 63° 20′ N.*, long. 41° W."

Explain the meaning of the words and figures printed in italics. (O.P.)

17. Discuss, with examples, the relative value of mountains and rivers as frontiers, with examples from Europe. (L.M.)

18. Give a description of the natural advantages of the sites of Hamburg, Lisbon, Milan, Prague, Salonica. (L.M.)

19. Compare generally the various climates you would expect to find in the following districts: North Russia, the shores of the Mediterranean, West Norway, Central Spain. Give reasons for the variety. (Col. Prec.)

20. How is it that:
(*a*) Holland and Belgium have become rich countries?
(*b*) The Baltic freezes while the North Sea remains open?
(*c*) Navigation on the Danube is often difficult?
(*d*) Italy has so many famous cities? (Col. Prec.)

21. Give the chief vegetable productions of Northern Italy, Northern France, and Southern Russia. At what time of the year do we find rain falling in these areas? (Col. Prec.)

22. What makes communication difficult between the Mediterranean Sea and the great northern plain of Europe? Give the chief commercial routes connecting the two. (Col. Prec.)

23. How is it that:
(*a*) Europe has many fine harbours?
(*b*) Russia has a climate of extremes?
(*c*) The Rhine is a useful river?
(*d*) Invalids like the Riviera? (Col. Prec.)

24. Say what you know of five of the following towns: Barcelona, Genoa, Naples, Constantinople, Budapest, Basel, Kiel, Berlin, confining your statements to facts of present importance, and in each case connecting such facts with the geographical position. (C.S.)

25. Describe fully the differences between a maritime and a continental climate, mentioning the causes of the differences.
Give an example of each kind of climate.
Mention an example of two places on the same or nearly the same parallel of latitude whose climates differ; describe the differences. (O.J.)

26. Describe the positions of five of the chief coalfields on the continent of Europe, and give the principal manufacturing towns that have grown up on them. (C.S.)

27. Explain the terms: lagoon, fen, sierra, tundra.
Name a sea communicating with the ocean in which the rise and fall of the tide is slight, and explain the phenomenon. (C.J.)

28. Indicate the position of the following places, and name a prominent industry for which each is noted: Amsterdam, Carrara, Dijon, Leipzig, Milan, St. Etienne. State what you know of the Landes, Puy de Dôme, the Steppes. (C.J.)

29. Select *three* seaports on the Atlantic coast of Europe, one belonging to France, one to Germany, and one to the Netherlands.
Describe carefully the position of each.
State which you think is the most important of the three commercially, and account for its pre-eminence. (O.S)

30. On an outline-map mark :
(*a*) the Vosges, the Black Forest, the Dinaric Alps, the Pyrenees;
(*b*) the rivers Seine, Vistula, Tagus, and Theiss ;
(*c*) Piedmont, Bavaria, Servia, the Landes ;
(*d*) the towns Amsterdam, St. Petersburg, Rouen, Dresden, Venice, and Göteborg.
Show, by shading, the positions of the chief regions producing iron ore. (O.S.)

31. Describe a journey from London to Venice, *either* (*a*) by a quick sea passage, *or* (*b*) mainly by railway across Europe. Mention four important towns or ports on the route you choose ; also name the countries and describe those physical features which would be seen. (C.J.)

32. Describe the positions and natural advantages of Christiania, Dresden, Milan, St. Petersburg, Stettin. (C.S.)

33. On an outline-map of Europe mark :
(*a*) the Carpathians, the Erz Gebirge, the Jura, the Balkans ;
(*b*) the rivers Douro, Dnieper, and Loire ;
(*c*) Bulgaria, Poland, the Morea, Provence, Andalusia ;
(*d*) the towns Riga, Basle, Brindisi, Patras, Oporto, and Kazan.
Draw a line showing the northern limit of wheat cultivation. (O.S.)

34. Name a portion of Europe which is a "natural grass" region. Point out the climatic conditions which make it such. Give some account of the occupations of the inhabitants of the region you select. (O.S.)

35. Describe and account for the physical characteristics of the principal types of coasts. Illustrate your answer by reference to European examples. (L.M.)

36. Show that physical factors have influenced the localisation of the following manufactures : (*a*) silk, (*b*) cotton, (*c*) linen. Give European examples. (Liver. Univ.)

37. Give the meaning of the following terms, and one European example of each with its position : lake, strait, peninsula, volcano, isthmus, plateau, delta, and watershed. (Col. Prec.)

38. How is it that:
(*a*) Constantinople is colder in winter than Naples?
(*b*) The Elbe is more useful for ships than the Danube?
(*c*) Belgium is more densely populated than Russia?
(*d*) Nice has a more pleasant climate than London?
(*e*) There are only two railways into Spain from France? (Col. Prec.)

39. What, and where, are the Huertas, Karst, Landes, Steppes, and Tundra? (Col. Prec.)

40. How is it that:
(*a*) Norway is milder than Sweden?
(*b*) The Black Sea ports are frozen in winter?
(*c*) The Seine is more useful than the Loire?
(*d*) So much wine is made in Spain and Portugal?
(*e*) Austria-Hungary is so hard to govern? (Col. Prec.)

41. In the geography of Europe, what do you know of:
(*a*) Lands below sea-level?
(*b*) Black Sea rivers?
(*c*) Swiss lakes?
(*d*) The great plain of Prussia?
(*e*) Spanish mountains? (Col. Prec.)

42. What do you understand by a "physical map of Europe"? In looking at such a map, what would you consider the most striking features? (Col. Prec.)

43. What, and where, are four of the following: the Plain of Lombardy, the Simplon Tunnel, the Kiel Canal, the Sound, the Iron Gates, the Black Earth Lands, Etna? Why is each of the four important? (Col. Prec.)

44. Choose any four of the following towns: Gibraltar, Stockholm, Nijni Novgorod, Chemnitz, St. Etienne, Turin. State exactly where each is, why it is famous, and why it has grown up where it is. (Col. Prec.)

45. Choose any one of the following: the south-west corner of France, the Rhine Valley, North Russia, Switzerland. Write a short description of it under the headings:
(*a*) Nature of surface.
(*b*) Kind of climate.
(*c*) Effect of (*a*) and (*b*) on inhabitants. (Col. Prec.)

46. In what parts of Europe, outside Britain, are the following occupations carried on, and why: (*a*) cutting of timber, (*b*) making of wine, (*c*) sea-fishing, (*d*) growing of wheat?

47. Indicate the influence of climate in determining (*a*) the regions of large coniferous forests in Europe, (*b*) the wheat-growing areas of the British Isles. (Prelim. Cert.)

48. On a blank map of Europe indicate:
(*a*) A line representing 500 miles in length, lines of latitude 40° and 66½°, and lines of longitude 10° W. and 30° E.
(*b*) Sierra Nevada and Balkans.
(*c*) Don, Dvina, Loire and Vistula.
(*d*) Arran, Crete, Faroe Islands and Sardinia.
(*e*) Copenhagen, Munich, Seville and Turin.

(*f*) A railway connecting Paris with Moscow or Brindisi or Constantinople, with the chief towns it passes through.
(*g*) The Landes, Dardanelles, Cape St. Vincent, areas above the snow line, the hundred fathom line on the west coast, centres of volcanic activity, Lapland. (Cert.)

49. "Temperature is regulated by latitude." Criticise this statement, using well-marked climatic regions of Europe for purposes of illustration. (Cert.)

50. "The great manufacturing industries tend to locate themselves in groups of towns within well-defined areas."

What special reasons have brought this about? Select typical groups of allied industrial towns in the British Isles and compare them with typical groups on the Continent of Europe. (Cert.)

51. Give a clear and concise explanation of

(*a*) The productivity of the Huertas.
(*b*) The direct and indirect effects of the Föhn wind.
(*c*) The substitution of St. Petersburg for Moscow as the Russian capital.
(*d*) The usefulness of the railway from Lulea on the Baltic to Narvik on the Ofoten Fiord. (Cert.)

52. Describe the leading geographical features of *three* of the following:

(*a*) The orange-growing region of East Spain.
(*b*) The Riviera. (*c*) Normandy.
(*d*) The Lake of Geneva.
(*e*) The land of the Midnight Sun.
(*f*) The region occupied by the Kalmucks. (Cert.)

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